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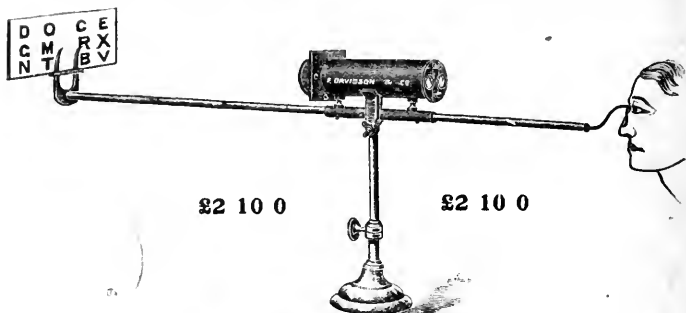
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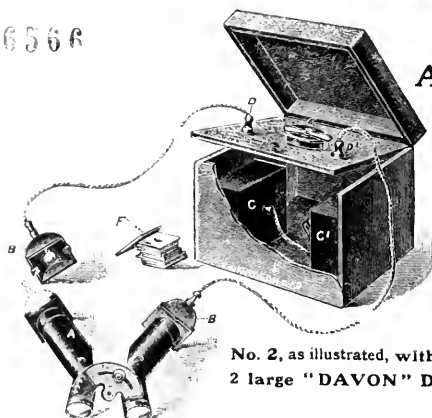


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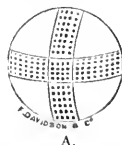
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ORIGINAL COMMUNICATIONS.

EXCAVATION OF THE MACULA, WITH SOME CASES
SHOWING ITS ASSOCIATION WITH ATROPHY OF THE
MACULAR BUNDLE.

BY

F. HARRISON BUTLER, M.D., OXON.

HONORARY OPHTHALMIC SURGEON TO THE COUNTY AND WARWICKSHIRE HOSPITAL;
LATE ASSISTANT SURGEON TO THE BRITISH OPHTHALMIC HOSPITAL, JERUSALEM.

THE term "macular hole" has come to mean a definite clinical condition which is sometimes seen in the macular region of the eye, generally after a contusion. My illustrative cases vary considerably from this picture, and I have, in consequence, called them "excavations."

A typical *hole* is a circular or oval spot, generally smaller than the disc, situated at the fovea, and depressed below the level of the retina. The depth is usually less than half a dioptré. The floor of this circular area is much darker in colour than the normal fundus, and may exhibit yellowish-white spots. The edge is clearly cut, and may be irregularly crenated. The retina round the hole is often opaque or oedematous (the *Trübung* of the Germans). Such a hole is shewn in Fig. 1. The condition was first accurately described by Noyes¹. Since then many cases have been published. There is now a fairly extensive literature on the subject. A full account of the growth of our knowledge in this direction is given by G. Coats in his paper on "The Pathology of Macular Holes."²

The macula lutea, as is well known, has a structure different from the rest of the retina. No rods are present, and the cones are long and narrow. The other layers are much thinner than in the retina proper, but at the periphery of the fovea some of them are much thicker than at any other part of the retina. The ganglion layer is especially thick at the edge of the yellow spot. The nerve-fibre layer disappears as a distinct structure near the edge of the fovea as the fibres join the central ends of the ganglion cells. At the middle of the macula, the retina is *very thin*, consisting chiefly of cone cells and the pigmented layer. A few of the inner granules are seen with some isolated nerve cells. According to Max Schultze, the *membrana limitans externa* is also cupped in at the macula, forming a *fovea externa* which may be as deep as the true fovea. The hyaloid membrane is very thin over the centre of the macula. The choroid, on the contrary, is thickened at this spot, the thickening being due to an accumulation of capillary blood-vessels. The nerve fibres of the retina, which are collected into small bundles and are united into a web with elongated meshes, form a layer which is almost wanting at the yellow spot and which ceases at its centre. Those fibres which leave the nasal portion of the macula pass direct to the optic nerve, those from the temporal, the superior, and the inferior aspects, sweep round in a sharp curve and enter the optic nerve on each side of the nasal group. They form the macular bundle and occupy the temporal sector of the optic nerve. This disposition is well shown in a drawing from Merkel, inset in Quain's *Anatomy*³.

The fibres of the optic nerve are chiefly afferent nerves having their trophic centre in the ganglion cells of the retina; they are the axons of these cells. There are only a few centrifugal fibres. These afferent fibres can be traced and isolated in the nerve by suitable lesions of the retina, and a section of any

portion of the nerve leads to degeneration on the proximal side (Parsons⁴). The fibres on the distal side also degenerate, which is contrary to the theory of Wallerian degeneration.

From the consideration of these anatomical facts it is obvious that the macula must be a weak spot in the retina, and that it is the most probable place for a blow to cause a rupture. We should expect that inflammation or oedema at the posterior pole of the eye would be most likely to injure the macula, the thinnest part of the retina. Extensive macular disease involving the ganglia should cause degeneration of the macular bundle, and consequent atrophy of the temporal sector and the papilla. Here theory is supported by practice. We do find that a blow on the eye causes a hole to appear at the macula, either immediately, as a tear by *contre-coup*, or after a greater or less lapse of time a hole follows a condition of oedema and retinal opacity. A hole may be found in the macula when there is no history of any traumatism. Thus, it may be consequent to severe irido-cyclitis, to hæmorrhage, to myopia, and to localised choroiditis.

No author, so far as I am aware, has in any way insisted upon temporal pallor as a concomitant of macular disease, but in two of the cases recorded below it was a very marked feature of the condition.

A case of direct tear by *contre-coup* is recorded by Coats (*loc. cit.*). A girl received a blow on her eye, and when it was examined histologically, a typical tear right across the macula was evident.

Twitmyer⁵ has recently described three cases in which opacity (*Trübung*) of the retina followed a blow, and ultimately the typical clinical picture of a macular hole evolved itself. His first example is especially interesting, for the fundus was examined soon after the blow and an area of opacity found in the macular region. This corresponded with a definite central scotoma for colours and for white. The oedema was observed gradually to give place to a hole.

Fuchs⁶ and Coats (*loc. cit.*) have examined eyes histologically which had macular holes. Fuchs' case was in an old man, who received a blow with a piece of wood. Iritis set in, and eventually the eye was removed. The macula was cystic, and the surrounding retina was cystic and oedematous. There was flat detachment. The ganglion-cell layer and the reticulate layers ceased abruptly at the fovea. Fuchs believed that the cystic oedematous condition of the retina was probably due to an inflammatory stimulus from the iritis at the anterior part of the eye. Coats' three cases all showed changes in the ganglion layer and nerve-fibre layer. In his first there were cystic spaces in these layers, and the ganglion layer ended in a blunt point. In his second there was atrophy of the nerve-fibre and ganglion layers. The third had a gap in the ganglion layer and both it and the nerve-fibre layer were much atrophied. The cones were completely absent from the fovea. In these four examples of macular holes which have been examined microscopically the ganglion layer has suffered. Such being the case, it is not surprising that, occasionally at any rate, atrophy of the temporal sector of the nerve is present.

F. Menteith Ogilvie⁷ and others regard macular holes as the result of direct concussion—action by *contre-coup*. Fuchs, Coats, Twitmyer, and others think that the blow causes local oedema, which evolves a hole. Kusch⁸ says that too much stress has been laid on the effect of oedema and not sufficient upon vascular changes, with resulting malnutrition and eventual atrophy. The fact seems to be that all these theories are correct. The macula is a *weak spot*, and easily falls a prey to concussion, to stretching, to malnutrition, and to inflammation.

The following four cases of excavation of the macula which have come under my notice are of an unusual type and appear to me to be worthy of record. None is the result of a traumatism, and one only presents the typical clinical picture of a true "macular hole."

Case 1—E.M., age 11, was found by the school authorities at Coventry to have defective vision. She herself never remembers the time when she could see figures on the black-board at school.

The child's mother is anemic; she has a suspicious pigmented scar on her nose; and suffers from severe laryngeal dyspnoea. She refused to allow me to examine her with the laryngoscope.

One child died aged 4, a second on the 14th day after birth, and a third, born before the present child, lived only a few hours. None of the children had any eruptions, but all had fits. Has lost in all four children. No miscarriages. The father has recently died of phthisis. Here we have tubercle in the father, and probably syphilis in the mother as possible aetiological factors.

E. M. is a delicate-looking child; she is intelligent, and has no obvious signs of tubercle or of syphilis. She does not give Calmette's ophthalmo-reaction after the instillation of a 1 per cent. solution of tuberculin. She has no cough.

R.V. under atropine = 2.50 $\begin{smallmatrix} +6.5 \text{ D. Sph.} \\ +1.5 \text{ D. axis } 10^{\circ} \end{smallmatrix}$ 5/20 partly.

L.V. " " " " 4.50 $\begin{smallmatrix} +6.5 \text{ D. Sph.} \\ +2.0 \text{ D. axis } 170^{\circ} \end{smallmatrix}$ 5/10 partly.

$\begin{smallmatrix} +9 \\ \diagup \quad \diagdown \\ \quad \end{smallmatrix}$ +7.5

$\begin{smallmatrix} +10 \\ \diagup \quad \diagdown \\ \quad \end{smallmatrix}$ +7.5

The glasses chosen are one dioptré less hyperopic than those indicated by a very carefully performed retinoscopy. This corresponds with the depression of the macula as measured with the ophthalmoscope.

The right posterior pole is occupied by a macular hole, which is almost as large as the disc (Fig. 1). It is slightly oval, and the surrounding retina is dusky and apparently diffusely pigmented. The edges of the excavation are clear-cut and somewhat crenated. The floor resembles an ordinary macular region, but is several shades redder than the surrounding fundus. On it are four yellowish-white spots. The centre of the depression is at least one dioptré deeper than the neighbouring retina. The disc shows very marked temporal pallor, but the atrophic condition is not so decided as in Case 2.

The left macula is represented by a very decided area of redness, and in the centre of the area is a small, pear-shaped, clear-cut depression (Fig. 2). The retina round the hole has a very granular, spaced appearance. The retina of the posterior pole of each eye is absolutely normal, and has the shot-silk appearance which is so common in young blonds.

The diseased macule are probably the result of a slight localised choroiditis. There is no history of a blow, and the bilateral changes rather exclude traumatic origin.

Case 2.—A J., aged 12, came to the Coventry and Warwickshire Hospital in October, 1907.

Patient is a highly intelligent, but nervous boy. He has been attending at the Ophthalmic Hospital for the past five years, and is now wearing dark glasses. He is perfectly healthy. No history of any injury.

EXCAVATION OF THE MACULA.

BY

T. HARRISON BUTLER, M.D.

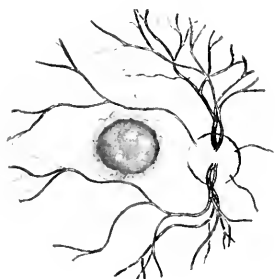


Fig. 1
Right Eye. Direct Image.

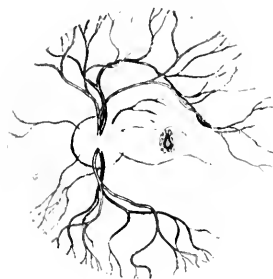


Fig. 2
Left Eye. Direct Image.



Fig. 3
Right Eye. Direct Image.

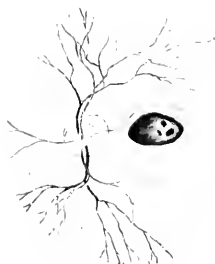


Fig. 4
Right Eye. Indirect Image.



Fig. 5
Left Eye. Indirect Image.

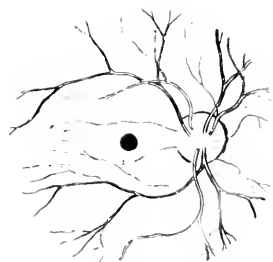


Fig. 6
Right Eye. Direct Image.

R. V. under cycloplegic fingers at one foot, not improved.

L. V. " " 5.10 c. + 3 5 5.

" 0.25 3

" 0.25 3

The left macula is dusky, but there is no definite pigmentation.

The right macula is surrounded by a slightly elevated ring of tissue, which is almost as large as the disc. This ring is white on the temporal and superior aspects, below it is the same colour as the surrounding retina. The nasal side is covered with pigment, but between the pigment masses the white and pink raised ring is seen. Its centre is excavated down to the sclerotic on the outer side, where it is dead white. The inner side of the pit is covered by a lip of tissue which is redder than the surrounding fundus. There is some pigmentation on the outer aspect of the ring. Numerous choroidal vessels pass radially over the ring and dip into the depression, but they are not seen on its floor. A retinal vessel passes over the edge of the ring, and dips down into the pit, crosses its floor, and passes into the retina on the opposite side. The surrounding retina is abnormally dusky. An attempt has been made to represent the fundus in Fig. 3. This macular hole is almost certainly the result of a choroiditis at the posterior pole. There was no history of tubercle or of syphilis; and Calmette's reaction was not obtained.

The temporal sector of the right papilla is deeply excavated and has a bluish-grey colour. It presents all the appearances of white atrophy of the disc.

Case 3.—Rachel, a Jewess, age 28 years, came to the British Ophthalmic Hospital, Jerusalem, in 1906, complaining of bad sight.

She was a perfectly healthy young woman; married, two children, no miscarriages.

Five months ago patient had an attack of acute muco-purulent conjunctivitis, and during the attack she "suddenly lost the sight of both eyes." No history of any injury.

Patient's father was very short-sighted; mother is hyperopic to the extent of 1 D. in the left eye. The vision of her right eye is only = fingers at 2 metres. There is a nebula on the right cornea, and no fundus details can be seen.

Patient has a small leucoma in the lower part of the left cornea, V. R. and L. = fingers at 1 metre, not improved. T.n. Retinoscopy under cycloplegic:

$$\begin{array}{ccc} & +18 & \\ - & & +18 \\ & -18 & \end{array} \quad \left| \quad \begin{array}{ccc} & -18 & \\ & & -18 \end{array} \right.$$

The *right* fundus shows a very abnormal appearance at the macula. There is a deep fusiform excavation, longer than the disc in its horizontal meridian and about 2/3 as broad. The excavation is *bright-green* in colour over the greater part of its extent, but towards the disc the colour is much deeper. There are three dark-green patches on the temporal side of the excavation. The condition is shown in Fig. 4, which is not exaggerated, or more brightly coloured than the original. This is a small posterior staphyloma. My original drawing shows no temporal pallor of the disc, nor is it mentioned in the notes. The retina presents the usual stretched appearance which is found in high myopia, but it shows no special alteration around the macular excavation; there was no abnormal pigmentation, nor oedema or opacity.

The *left* fundus presents a different picture, but it helps to explain the genesis of the condition found in the right eye. There is a much larger staphyloma, which is more marked on the macular side of the disc. Stretching from this staphyloma is a series of horizontal scars in the retina, the highest of which sweeps upwards in a curve. These scars are not so dead-white as the staphyloma, but, on the contrary, have a yellowish tinge. The macula itself is represented by a small green hole. The green is of the same quality as that seen in the right macula, but of a deeper shade. A large recent hamorrhage covers the whole posterior pole of the eye. The retina is even more stretched and spaced than the right retina. There is no optic atrophy. Fig. 5 gives some idea of the appearance of the fundus.

My interpretation of the case is that in consequence of extensive stretching of the posterior pole, the result of rapidly increasing myopia and elongation of the globe, the retina tore in each case at the *weak spot*, namely, the macula. A hamorrhage followed, and the hamoglobin gave rise to the green colouration. In the left fundus, in addition to the small rent at the macula, there has been extensive tearing of the retina and choroid, forming the scars seen at the posterior pole. The large hamorrhage is quite recent.

Case 4. Jacob, a Jew, age 40 years, came to the British Ophthalmic Hospital in 1906, asking for spectacles. R. V. = fingers at 2 metres. L. V. = 6/6. There was no history of an injury. The yellow spot is occupied by a deep hole, about one quarter the diameter of the disc. The sides of the excavation are dead black in colour, and the floor is stippled a deep slate colour. The fundus is otherwise normal.

Unfortunately, I have no note of the condition of the disc in this case, and my original drawing, being in black and white, does not answer the question as to whether there was temporal atrophy of the disc. The condition is shown in Fig. 6. It was most probably the result of a macular hamorrhage.

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* Abstracted in this Journal, December, 1908, p. 1010.

THE PRESENT STATUS OF MULES' OPERATION AND OF DELAYED IMPLANTATION OF A GOLD BALL*

BY

L. WEBSTER FOX, M.D., LL.D.,

F.R.S. (EDINBURGH).

In 1886 Mr. P. H. Mules, of Manchester, modified the operation of simple excision performed by the older ophthalmic surgeons by the insertion of a gold ball into the scleral cavity.

During a visit to Liverpool in 1893, I was present at an operation (Mules')

* Read at the Ophthalmological Section of the Southern Medical Association at Atlanta, Ga., U.S.A., November 11, 1908.

performed by Mr. T. Herbert Bickerton. The result obtained was such a great improvement upon that of enucleation that I concluded to adopt the method upon the first opportunity. On 4th October 1893, I performed my first Mules' operation in the Medico-Chirurgical Hospital, Philadelphia. Since then I have performed the operation a great many times, and have made several very important modifications in the *technique* outlined in the original method. For the better understanding of the operation I have divided it into different stages.

First Stage.—After general anesthesia, the skin around the eye, including that of the eyebrow and eyelids, is carefully cleansed with neutral soap and warm water, followed by douching with a solution of bichloride, 1 to 2,000. The face is covered by a veil of gauze which has an opening over the eye to be operated upon.

Second Stage.—An eye speculum is introduced between the lids, the conjunctiva is separated around the corneal margin with straight scissors, and dissected back as far as the equator of the eyeball, freeing the conjunctiva, Tenon's capsule, and all intervening tissue. A Beer's knife is passed through the upper half of the cornea, as in the old flap operation for the extraction of cataract. This flap is then grasped with forceps, and the lower half of the cornea is removed with curved scissors.

Third Stage.—The contents of the globe, vitreous, retina, and choroid, are removed by inserting a spoon-shaped instrument between the ciliary body and sclera, rotating the scoop around the scleral cavity several times and with the last turn making a sweep across the head of the optic nerve, and finally withdrawing the scoop with the scleral contents. In this way I have, on many occasions, completely eviscerated the contents of the globe unbroken. When this is not possible, the cavity may be cleansed with gauze sponges wrapped around the tips of the forceps. To prevent hemorrhage from the central artery, the cavity is packed with iodoform gauze which is allowed to remain a few minutes. From the corneal opening, both above and below, a small triangular portion of the sclera is cut out in order that the coaptation of the scleral edges over the gold ball may be more nicely adjusted. If this is not done, puckering edges of the sclera will project through the conjunctiva, interfering with the adjustment of an artificial eye later on.

Fourth Stage.—All muscles are snipped close to the eyeball; after which the eyeball stands out relieved from all attachments excepting the optic nerve.

Fifth Stage.—A 13 mm. or 14 mm. gold ball, carefully sterilized, is introduced into the scleral cavity by a specially devised instrument. The edges of the scleral opening are then united vertically by means of white silk sutures, two lines apart. It is sometimes with great difficulty that the needle is passed through the edges of the sclera on account of the density or toughness of the tissues. If, however, an eyelet forceps is used the passing of the needle becomes easy. The conjunctival opening is closed by eight or ten stitches placed at right angles to the vertical scleral line. In stitching the conjunctiva it is very important to pass the needle also through the capsule of Tenon, because in so doing, the heads of the four recti muscles are again brought forward and subsequently re-attach themselves to the eyeball, so that little or no rotation is lost. In many of my earlier operations I found that, notwithstanding the exercising of all care and perfection of *technique*, the central stitches of the scleral wound would give way and the gold ball would be exposed and eventually expressed. Upon seeking the cause I came to the conclusion that owing to the great irritation caused by the separation of tissue

around them the attached muscles became contracted, and in this way pulled upon the stitches in the sclera with great force, so that the weakest spot would be at the centre of the scleral wound, which would, therefore, give way. After all the muscles were tenotomised there was no further trouble of this character. The cavity is always thoroughly irrigated with 1 to 2000 bichloride of mercury solution after the completion of the operation.

A glass or gold plated "conformer" is then inserted between the eyelids. The "conformer" (Fig. 1) is shaped to the contour of the globe, and acts like



FIG. 1.

a splint and support to the conjunctival and scleral wounds. Over the conformer the cavity is filled with an antiseptic powder, such as xeroform or bismuth formic iodide (Mulford), and then the lids are closed.

Sixth Stage.—A bandage producing a fair amount of pressure is adjusted over both eyes, and it is not removed for 48 hours. Sometimes, if there be excessive reaction, indicated by great pain, the bandage is slit vertically over the ears with a pair of scissors to relieve pressure, but the bandage is not removed. However, this happens but rarely. In cases of extreme pain I have resorted to an opiate for relief. My object in using this bandage is to keep the eyelids closed, preventing any movement of the eyeballs. Healing then goes on very rapidly. The bandages are removed at the end of 48 hours, and both eyes are bathed with warm sterile water. The operated eye has then an additional bath of water, as hot as can be borne, by the hand of the dresser. The cavity is thoroughly irrigated with hot boric acid and camphor water lotion. The conformer is not as yet taken out. Both eyes are again bandaged, but instead of a dry antiseptic dressing we substitute an antiphlogistic lotion, consisting of the following formula:—

R	
Liquor plumbi subacetatis dil.	5 ij.
Tinctura opii	
Tinctura belladonnæ	aa 5 iss.
Tinctura arnicæ	5 i.
Aquæ camphoræ	
Aquæ destillatæ aa q.s. ad	3 iv.
M. Sig.	

This lotion is applied constantly to the operated eye in the form of iced compresses. It should be placed in an iced bowl and the compresses kept wet by dropping the cold lotion on them throughout the day and night. By such methods excessive swelling is prevented. The conformer and the conjunctival stitches are removed on the third day. This is important, as I have found stitch-abscesses would develop if they were allowed to remain longer. The scleral sutures remain permanently. There is always some swelling of the lids and at times there is considerable oedema of the conjunctiva, which, however, should cause no anxiety. The artificial eye is not usually adjusted until four or six weeks have elapsed.

Under what conditions should the operation be performed?

I have operated upon all forms of staphyloma of the cornea, upon cases of absolute glaucoma, buphthalmos, non-traumatic irido-cyclitis, and upon cases resulting from injuries of all kinds.

Whenever an eyeball is so seriously injured that enucleation is inevitable and there is no evidence of general infection, a Mules' operation can be performed successfully. A slight infection along the lips of the wound is not detrimental, as such a small point of infection can be controlled, especially if the wound lies in the anterior segment of the globe.

Whenever panophthalmitis is in evidence, prompt enucleation should be performed. I have again and again attempted to give the patient the benefit of a Mules' operation, but could not control the pus formation and invariably the deep scleral stitches would give way and the ball be expelled.

The Mules' operation should not be performed in cases of ocular growths, as they will again make their appearance, even although apparently all the growth has been removed from the scleral cavity. In one case a diagnosis was made of a sarcoma of the choroid with the ophthalmoscope. The tumour, a small one, was located down and out and well forward of the equator. At the time of the operation the tumour was found to be in this exact location and was removed with the choroid coat. The gravity of the disease was explained to the patient, but she begged that the eyeball be saved. A Mules' operation was performed, but at the end of three years a new growth developed in the orbital cavity, and only an early death prevented an exenteration of the orbit. This patient died from metastatic sarcoma of the liver and intestines, as was shown by the *post-mortem* examination. In cases of phthisis bulbi of ten years' standing, one usually finds a shell of bone within the shrunken globe. In such cases it is better to enucleate, although I have had some successful cases in which the eyeball was not greatly shrunken, and after removing the bony shell I have succeeded beyond my expectation.

Has Mules' operation stood the test of time and will it find its place among the permanent operations in ophthalmology?

I believe it will, but the operations will be limited for several reasons.

First.—The operation requires more time and technical skill to perform than enucleation. This fact alone will lessen the number of operators who will perform it.

Secondly.—The principal objection that is always brought forward by the opponents to this method is the fear of sympathetic ophthalmitis. This thought easily impresses the timid, and it is a second factor in further reducing the number of operators.

Thirdly.—The majority of ophthalmic surgeons remote from the centres of manufacturing and mining districts do not meet with many accident cases requiring enucleation, which further lessens the number of operators from the fact that these operators, not having much experience, grow timid and naturally prefer the simpler method of enucleation. The preference of the operation is, therefore, left to those few operators whose environments constantly supply them with suitable cases. This small body of men will, however, have the courage of their convictions, and will perform the Mules' operation in preference to enucleation whenever the conditions of the case permit.

In a large number of cases 385 extending over 15 years, I have not had one case of sympathetic ophthalmitis follow this operation. In one case, where sympathetic ophthalmitis had shown itself in the fellow eye in the form of irido-cyclitis, I performed a Mules' operation instead of an enucleation, and had the satisfaction of seeing the inflammatory process rapidly clear away in the sympathizing eye. The removal of the contents of the primarily affected

eye seemed to remove the cause of the irritation. This patient is still under observation, and no trouble has been experienced in five years.

Mr. Mules laid down six reasons why this operation should be performed instead of enucleation of the eyeball:—

1. It secures a retention of the framework of the eye.
2. A firm, round globe forms a perfect support for an artificial eye.
3. Perfect harmony of muscular movement is retained.
4. When such a case is fitted with a selected eye it defies detection.
5. There are no qualms as to the personal appearance of the patient.
6. There is no interference with the growth of the orbit.

Remarks.—Whilst I place the operation for cataract and glaucoma first in importance, I should certainly make "Mules" a good second on account of its delicate *technique*.

Substitutes for Mules' operation.

Have we a substitute which will take its place, and at the same time give the patient the same advantages as those enumerated by Mules?

Implantation of a glass or gold ball in the orbit, as devised by Mr. W. Adams Frost in 1886, and later modified by W. Lang, has been abandoned by myself and others on account of the frequent expulsion of the glass ball, which was in use at the time this operation was followed. This is brought about in the majority of cases by the contraction of the post-orbital tissues and friction of the artificial eye with the conjunctiva, which in time produced an opening in the thin covering over the glass ball. Even a Snellen reform eye will not permit this friction, and in time the ball will be expelled, so that this method has, therefore, been practically abandoned.

Delayed Implantation.

Implantation of a gold ball in cases where the eyeball has previously been removed.

This operation will place a valuable substitute in the hands of those operators who fear the Mules' or the Frost-Lang operation. In 1897, I devised such an operation, but it was not until 1900 that I succeeded in overcoming several defects which were patent in my operation. The details of the method were as follows: I made an incision through the conjunctiva and tissues of the orbit, in the horizontal direction, 14 millimetres long, corresponding to the diameter of the ball to be inserted. The upper lip of the conjunctiva was raised, and with sharp-pointed, curved scissors, the conjunctiva, with the connective tissue adjoining it, was snipped in all directions around the incision, making a pouch into which the ball would fit. The edges of the conjunctiva were brought together over the ball by six or eight stitches. The defect in this operation soon became manifest in healing; the contraction of the tissues forced the ball forward and caused a rupture of the central stitches, exposing the ball, which in a short time came out. A loss of 33 per cent. compelled me to seek another point of incision through the orbital tissues. Eventually, about eight months ago, I devised my present method, and this I can safely recommend. The operation is easy to perform and the gold ball is retained.

If the operation is to be performed in the right orbit, I carry out the details as follows. The eyelids are kept apart by a speculum, the conjunctiva is then grasped upward and inward, above the inner canthus, and the tissues are well pulled out. I then pass a Beer's knife through the tissues,

somewhat obliquely and well down into the orbit; this opening must be made large enough to receive the ball, which later on is pushed into it behind the tissues, conjunctiva, Tenon's capsule, etc. Through this opening I insert a pair of curved scissors, and separate the structures from the cellular

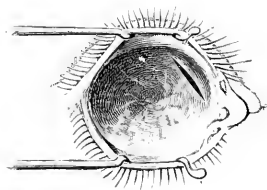


FIG. 2.

tissues around the orbit, thus giving me a large pouch (fig. 2) into which the globe can be inserted. I have discarded glass and silver balls, and use only gold balls, 12, 13, and 14 millimetres in diameter.

The gold ball is inserted through the opening with a scoop and placed in permanent position which is retained by a shell modelled after an artificial eye, and called a "conformer" see Fig 1. I allow the primal incision to take care

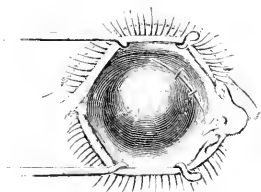


FIG. 3.

of itself without stitches, then place the conformer over the buried ball, and by gentle manipulation on this metal plate rotate the ball into its permanent place. The circular opening in the conformer allows the gold ball to fit the space.

The eyelids are then closed over the conformer, which is left in place for twenty-four hours. The eyelids also help to keep the ball in place. These conformers are made of metal, gold-plated. The results obtained by this method are perfect: no secondary trouble follows, all the incised parts healing by first intention, with little or no swelling of the orbital tissues.

It can be readily understood that the gold ball cannot break through the centre of the conjunctiva, and, as the opening is out of line of pressure, it soon closes up. If the operation is to be performed on the left orbit, the incision is made upward and outward above the external rectus muscle, and the dissection is carried out as above described.

Remarks.—In all cases where it is possible I practise Mules' operation, on account of the prominence and rotation given to the artificial eye. Those surgeons desiring a substitute which will overcome the prejudice to the Mules' method, on account of the retention of the sclerotic coat with the posterior ciliary

and optic nerves and their close relationship to the fellow eye, thereby inviting danger from sympathetic ophthalmitis, will find in this operation delayed implantation one that is free from such a probability, and at the same time they will have a substitute which gives almost all the advantages of the Mules' method and none of its alleged dangers.

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CLINICAL MEMORANDA

THE TREATMENT OF SEPTIC CONDITIONS OF THE EYE BY MEANS OF VACCINES.

BY

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THE treatment of septic conditions by the administration of emulsions of dead bacteria has been little commented on by ophthalmic surgeons, and yet the few cases which have been recorded have, for the most part, been most encouraging. It seems, therefore, expedient to publish two other successful cases, so that the attention of ophthalmologists may be drawn to a mode of treatment which offers hope in cases otherwise desperate.

The first case was one of cataract extraction. The patient, aged 76 years, did remarkably well for five days, by the end of which time the wound was soundly healed and the eye almost free from infection.

On the evening of the sixth day, there was sudden severe pain in the eye, of a neuralgic character, and it became evident that there was a grave attack of iritis present, which gradually, in spite of general treatment, assumed the appearance of a septic inflammation. He was seen in consultation by Mr. J. H. Parsons, and, later, by Sir Anderson Crichtett, who agreed that there was some septic trouble, probably (since the wound was never in the least disturbed) metastatic in origin, and who pronounced the condition of the eye extremely grave. Feeling that there was no time to lose, I suggested treatment by emulsion of staphylococci, even before the opsonic index had been taken. A small dose (100 millions) was given at once by my colleague, Dr. H. R. D. Spitta, and an examination of the blood was undertaken, which showed a normal index for several other possible organisms, but a lowered index towards the staphylococcus.

Within 48 hours I was able to feel sure that the iritis had become stationary, and in another two days there was evident improvement. There had been a small hemorrhage into the anterior chamber, and this had cleared up; the cloudy aqueous was less turbid, the iris was a little brighter, and the pain was less. Repeated doses of the emulsion were given by the mouth, under the direction of Dr. Spitta, until, in all, six doses were given, spread over the time between June 16th and July 24th; the dose was gradually increased from 100,000,000 to 700,000,000. At the latter date the injection had very largely disappeared, and the patient went down into the country. I saw him at intervals of two or three weeks, and at the end of August was pleased to find the eye quite free from infection, and the iris bright in colour; the pupil was normal, with a dense membrane; vision was 1/60; projection perfect; tension normal. The iris was a little *bombé*.

I advised the continuance of drops of atropine and dionine. At the end of September the patient came back to town with the eye in the same condition. As the right eye was failing rapidly, and as, further, the left iris was still *hombé*, I decided to divide the after-cataract as soon as possible. As a precaution, Dr. Spitta again examined the blood, and as the index towards staphylococci was rather low, two or three doses of emulsion were given. Finally, on October 29th, I divided the after-cataract with a Hartridge's knife, securing a clear opening which gaped kindly. The progress on this occasion was uneventful, and on November 9th the patient was delighted to find L.V. c. +11.0 D. 6/9 partly, and c. by +15.0 D. 0.3 Sn. readily.

The source of the infection remains, in this case, obscure; it can hardly have been direct primary infection, and the wound healed with such rapidity that secondary infection through the wound may be excluded with some probability.

The second case was that of Mrs. S. D., who consulted me in the beginning of 1907, on account of her right eye, the sight of which had failed about a month. She had consulted another surgeon, who had diagnosed detachment of the retina and had advised excision. To this she was strongly averse. There was a large detachment of the retina, but nothing to show the cause; there were some large opacities in the vitreous, but nothing that suggested the presence of a neoplasm, and, therefore, it seemed right to allow her to keep the blind eye, watching her carefully against any signs of irritation.

I saw her at intervals up to July, 1908, when I noted that the lens was becoming opaque; there was no sign of increased tension.

On October 25th she came again, with the eye very painful and red, and at first glance it seemed to me that I had been wrong in delaying excision, as I had done. A second glance showed that there were many more inflammatory symptoms than were to be expected if the change were due to a growing neoplasm; the iris was muddy-green, and there was a hæmorrhage into the anterior chamber from a dilated iris vessel. The partially opaque lens allowed the suspicion of a yellowish reflex from the vitreous. Tension normal. Knowing that the eye was blind, I advised Mrs. D. to allow me to remove it, to prevent further pain; but she was still unwilling. On enquiry as to the possible cause of the infection, she told me that she had quite recently had an abscess in her mouth, which had ceased to discharge two days before.

She was given a dose of emulsion of staphylococci (100 millions), and the eye rapidly became quieter; the pain ceased within forty-eight hours, and the injection diminished. After an interval of seven days, she was given a second dose of 200 millions, and later a third, of 400 millions. By this time the eye had resumed its usual appearance, was free from redness and pain, and the immediate necessity for excision had gone also.

Neither of these cases is complete, since in neither was the exciting organism found, and both were treated empirically. Nevertheless, they are not without interest, and this must be my excuse for making them public.

It should be added, finally, that the emulsion was given in both cases by the mouth.

AN UNUSUAL CASE OF CONGENITAL PTOSIS.

BY

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Introduction.—The following case, which came under my notice at the Wolverhampton Eye Infirmary, appears to me to be worthy of record, on account of the association of a unilateral, non-hereditary congenital ptosis, with defects of mobility and abnormality of the pupillary movements.

Apparently in all other cases which have been described the pupillary movements are normal.

In Vol. III, Part I, of Parsons' *Pathology of the Eye* it is stated: "It is noteworthy that the pupillary movements and accommodation are always normal." A further point of interest in the case is found in the presence of an incomplete lacrymal fistula on the same side.

Case.—M. K., aged 3½, female, is the fifth child of six, of whom the first and fourth are dead; the first, a male, dying shortly after birth, the fourth, a seven-months child, living four days; the remaining three, two boys and one girl, are alive and well, none of whom show any signs of congenital defects.

The general family history is also negative in this respect; as far as can be ascertained all relations, distant and near, have and have had particularly good vision, several of the males being seafaring men.

The maternal grandmother is alive and said to be suffering from "cancer."

With regard to the birth of the child; labour took place at full term and occupied three hours, it was easy and no instruments were used; the presentation was occipital and there were no signs of bruising of the head present. Within half-an-hour of birth it was noted that whilst the left eye opened in a natural manner, the right remained closed.

During the first week a slight mucopurulent discharge took place from the right eye only, and during the first twelve months there was an occasional slight discharge, similar in character from a point just inside the inner canthus of the same side, since then, however, nothing of that nature has taken place.

According to the parents, the child is of a rather peculiar disposition, she is shy and retiring, preferring to play by herself, and showing strong likes and dislikes. She is not unintelligent and appears to possess a good memory.

She has had no illnesses, is quite strong and healthy, and is well developed in every other respect.

The present condition of the right eye:—On causing the child to look straight with the left eye, the pectus of the right lid is very noticeable, there is a small palpebral aperture of 4 mm. at its widest part in the centre; upward movement of the lid is completely absent; an accessory frontalis movement is, however, just commencing.

On raising the lid, it is seen that there is a marked divergent strabismus, which on measurement proved to be 25°, and that this is combined with a downward rotation.

Movement of the globe is absent in an upward and inward direction, but present to a very slight degree downward; abduction is also present to a certain degree, but not fully so. The eye itself appears to be of equal size with its fellow, and healthy. The pupillary measurements are: in good daylight, R. 2·5 mm., L. 3 mm., under atropine, R. 5 mm., L. 6 mm. There is the faintest reaction to light but apparently none to accommodation. Under eserine the pupil contracts to 1 mm., but with cocaine there is no reaction. Examination of the media and fundus is difficult on account of the rotation, shown by the child, but by the fleeting glimpses obtained the media seem clear and the fundus normal.

The right vision is moderate; at one metre objects, such as pens, a small pair of scissors, etc., are recognised and named.

The left vision is good, and the eye itself normal and healthy.

There is an incomplete lacrymal fistula present on the right side, and is represented by a small eccentric opening, with its concavity downwards and slightly outwards, and situated just to the inner side of and below the inner canthus; the opening just admits the point of a very fine probe.

From the presence in a case in which other congenital abnormalities in connection with the eye and on the same side exist, it seems highly probable that the origin of the fistula is due to a failure of the lacrimal duct to completely close.

Comments.

The chief point of interest in the case lies, of course, in the presence of abnormal pupillary movement, associated with congenital ptosis and motile defect.

From the condition of the pupil and its behaviour to light and drugs, it is evident that the internal musculature of the eye is imperfect; the actual nature of this is difficult to determine, but from the fact that the sphincter

is present, as shown by the reaction of the pupil to atropine and eserine, especially the latter, whilst there is no apparent reaction to accommodation as compared with the left sound eye, it may be reasonably supposed that the lesion is a nervous one rather than a muscular.

The case is comparable with, though less marked than, those reported by Sydney Stephenson and Levinsohn, and may be said to support the former's view which inclines to the opinion that most cases of congenital ophthalmoplegia are due to an affection of the nuclear centres which govern the defective movements (THE OPHTHALMOSCOPE, September, 1908). Operation in this case, by revealing the state of the muscles, will throw more light upon its aetiology.

CALCIFIED FIBROMA OF THE ORBIT *

BY

J. N. ROY, M.D.,

OPHTHALMOLOGIST TO THE HÔTEL-DIEU, MONTREAL, CANADA.

Case Report.

Edmond C., aged 14 years, was brought to the Hôtel-Dieu on the 20th February, 1907, for a tumour of the left orbit. His mother told us that from the beginning of the year 1904, her son had complained of slight pains in the left eye, as well as of weakness of vision. This eye until then had always been straight, but from that time it had a tendency to diverge. The symptoms increased up to October of the same year, when slight exophthalmos and limited movements of the eye were noticed. An ophthalmic surgeon, who then had the patient under his care, has had the kindness to transmit to me the following notes: "On examination, I found and removed a growth of the size of a hazel-nut, situated at the inferior external angle of the orbit. The operation was followed by considerable infiltration and insensibility of all the orbital tissues, and pronounced exophthalmos. Some days later, neuro-paralytic keratitis came on, and as it was impossible to save the eye, excision was performed. The insensibility was so complete that this excision was practised without cocaine or chloroform and caused no pain. After three or four weeks, the tissues had not regained their sensitiveness, or their normal size. In presence of these trophic and vaso-motor troubles of the eyeball and of the contents of the orbit, I inferred a serious lesion of some branches of the trifacial and of the sympathetic. These nervous lesions, however, not being definite, I preferred to wait before emptying the orbit."

"As the patient was poor, and could not afford the expense of living away from home, he returned to the country with instructions as to the necessary treatment, and a request to return later. The neoplasm was entrusted to a *compère* for histological examination, but, unfortunately, the report was never furnished me. During his first stay at the hospital, the patient was subject to attacks of coughing, tightness of breath, and tachycardia, which I believed were of nervous origin."

During the two years that followed the two operations, the swelling of the orbital tissues, mentioned in the preceding Report, constantly increased. The patient complained of sharp pains and a feeling of fulness of the orbit, which was complicated by daily headaches. There was always a sanious discharge from the wound, in spite of antiseptic washes repeated twice a day. The tumour, in developing, produced a considerable ectropion of the upper eyelid.

* Read before the Canadian Medical Association, Ottawa, May 1908.

During the last four months preceding our consultation, the parents observed that the child was nervous, pensive, wept for nothing, became angry easily, and was not as intelligent as formerly. The appetite was good, but the sleep was broken, and involuntary movements of the hands and feet occurred at times. Because of these symptoms, and the slow but continued increase in size of the growth, they decided to have a second examination made.

Family history.—The family of our little patient was composed of thirteen children, four of whom died young of infective diseases; the others possessed excellent health. There was nothing of interest from a hereditary point of view, and in especial no history of neoplasms of any kind.

Personal history.—The child had never been ill, but at the age of 3 years was scalded by boiling water on the eyelids and the left side of the neck. These burns, however, healed without complications.

Present condition.—On examination, we observed a large tumour which more than filled the left orbit (Fig. 1). This tumour extended about a centimetre above the upper rim and about two centimetres below the lower edge of the orbit. The eyebrow was pushed up, and a sero-purulent liquid escaped from the cavity. The neoplasm, which was slightly mobile, gave on palpation a sensation of resistance. The eyelids had a violet tint, due to venous dilatation. All this region had preserved its sensitiveness.

An absolutely normal condition of the right eye existed. Refraction gave us -0.75 120° V. -1 .

With the rhinoscope, on the right side we found a hypertrophic rhinitis, and on the left, a small spur on the septum, and a polypoid hypertrophy of the head of the middle turbinal. The patient had never had any discharge of pus from the nose. There was nothing to note concerning the pharynx, the tonsils, or the palate. Some decayed teeth added nothing of interest to this observation.

The diaphanoscope allowed us to observe that on the right, the pupil was luminous and the cheek translucent. On the left, the maxillary sinus was equally transparent, which assured us that this cavity had not yet been invaded by the orbital tumour. Normal condition of the frontal sinus.

Slight hypertrophy of the submaxillary glands, equally pronounced on both sides. The preauricular gland on the left was not increased in size.

We found no organic disease—no syphilis, or tuberculosis.

Treatment.—It was comparatively difficult for us to make a clinical diagnosis as to the nature of this tumour, which the microscope alone could do, whether it was bony, cartilaginous, or fibrous—sarcomatous or benign. From a practical point of view, ablation remained the only possible treatment, and the operation, being decided upon, took place on the 23rd of February.

First operation.—The patient chloroformed and the field of operation rendered aseptic, we made an external canthotomy the length of a centimetre, the incision being curved slightly downwards. The conjunctiva, which covered the entire extent of the neoplasm, was cut in the superior and inferior *pseudo-cuts-de-sac*, and the eyelids and the skin of the temple were carefully dissected with the scissors. The tumour was then entirely exposed to view; we could raise it in part, after having detached it from the orbital rim, upper, outer and lower. By aid of the curette, we finished the removal of everything that remained at the bottom of the cavity, going as deeply as possible in the direction of the optic nerve. These manoeuvres, moreover, were facilitated by the presence of a very thin capsule, which entirely surrounded the fibroma, and which is almost always met with in this variety of neoplasm. As the perosteum appeared totally invaded, we accordingly carefully took away all that had escaped our first curetting, and the orbital arch which was intact

received our special attention. The tumour weighed 55 grammes. The operation was followed by a thorough cleansing of the orbit, some sutures at the outer canthus, and a light compress dressing. The results following the operation were absolutely normal. We were pleased to notice in the days that followed that the left eyebrow was in line with the right. The orbital



Fig. 1.

cavity, cleaned daily with peroxide of hydrogen, suppurated a little, although the fungous granulations were removed by curetting or cauterizing. Nevertheless, it gradually became covered with a solid granular bed, which permitted us to consider our patient cured at the end of two months. All the symptoms shown before the operation had disappeared; the general health was better, and the intelligence developing. Although cured, we were not fully satisfied with our first operation, since it had been impossible for us to concern ourselves with the aesthetic part. The neoplasm in developing had caused the eyelids to undergo a forced dilatation; and, as after the ablation, everything sunk in the orbit, they had a tendency to retract to the point of leaving this cavity largely open. As, besides the unpleasant appearance, the patient would have been continually exposed to exterior infection, we performed on the 20th of April a partial tarsorrhaphy.

Second operation.—Again chloroformed, we detached circularly the eyelids at their base, on a level with the bony circumference of the orbit, and we continued this separation on the forehead and cheek in order to be better able to mobilise them. After cutting the inner two-thirds of their Meibomian lips, and completing the hemostasis, we applied some sutures, exercising great care in the ciliary field. A protective dressing completed this easy little intervention.

During the following days, we applied antiseptic washes to the orbital cavity, passing by the part not sutured, and as the secretion was dried up by the end of May, the patient was allowed to leave the hospital absolutely cured (fig. 1). We recommended, however, repeating the washings from time to time, by means of a syringe, in order to maintain the cure.



Fig. 2.

Dr Dupont, who was kind enough to undertake the examination of the growth, sent me the following microscopic report.—“Histological examination of a tumour of the size of a hen’s egg, developed in the left orbital cavity. The sections were of a muscle of the eye, and of the tumour, properly speaking. Particularly on those prepared by the van Gieson and Wiegert method, we observed that this mass was formed exclusively of connective tissue cells and bundles of fibres, which cross each other in every direction. These fibres were coloured by the fuchsin a characteristic pink, and the nucleus of the cells a blue colour. Numerous little centres of calcification were scattered through all its thickness. These deposits of calcareous salts had assumed a colouring of deep-black from the ferrie-hematoxiline. A band of fibrous tissue, the greater part of whose fibres were arranged in parallel lines, separated them from the ocular muscle. We found included in the tumour, a nerve, whose elements presented evident signs of degeneration, but it did not seem to be large enough to be the optic nerve. The muscle was also slightly sclerosed. On the other hand, the arteries and veins in the neighbourhood did not appear affected. In a word, it is a fibroma of slow development with many centres of calcification.”

Remarks.

For a long time, some ophthalmologists have denied, very wrongly, the possibility of the development of a genuine fibroma in the orbital cavity. In reality, all fibres carpeting or dividing the orbit can be the starting-point for this tumor, which can originate from the periosteum, from the sheaths of the muscles, from the optic nerve, or from Tenon's capsule. Although the fibroma of our patient was calcified in certain parts, this observation remains no less interesting from the point of view of its rarity. The evolution of this neoplasm equally deserves our attention, as well as the nervous phenomena which accompanied it. The exophthalmos, the decrease of vision, and the divergent strabismus, lead us naturally to believe that it had its origin from the fibrous bed at the bottom of the orbit, because, aside from this ocular projection, the eyeball had retained its normal position. The lack of sensitiveness, and the swelling of the retrobulbar tissues which followed the first operation, and which continued even after the enucleation, are also facts which we have never seen noted before.

We know that in certain cases the boundary line which separates fibroma from sarcoma is still very indefinite; however, in this case the very slow progress of the disease allowed us to foresee that we were in the presence of a benignant tumour. Moreover, the microscope confirmed our opinion, and allowed us to observe that the histological preparation showed fibroma with islands of calcareous infiltration; and it was impossible to find any sign of sarcoma.

Although the walls of the orbit were not altered by contact with the neoplasm, nevertheless it caused nervous symptoms which disappeared after the operation.

Of all the means at our disposal for the æsthetic repair of the orbital cavity, we believed it best to choose the partial tarsorrhaphy, which was completely successful.

As the cure has continued now for a year, we may hope that it is permanent

THE FREQUENCY AND CORNEAL COMPLICATIONS OF OPHTHALMIA NEONATORUM.

A Statistical Report

BY

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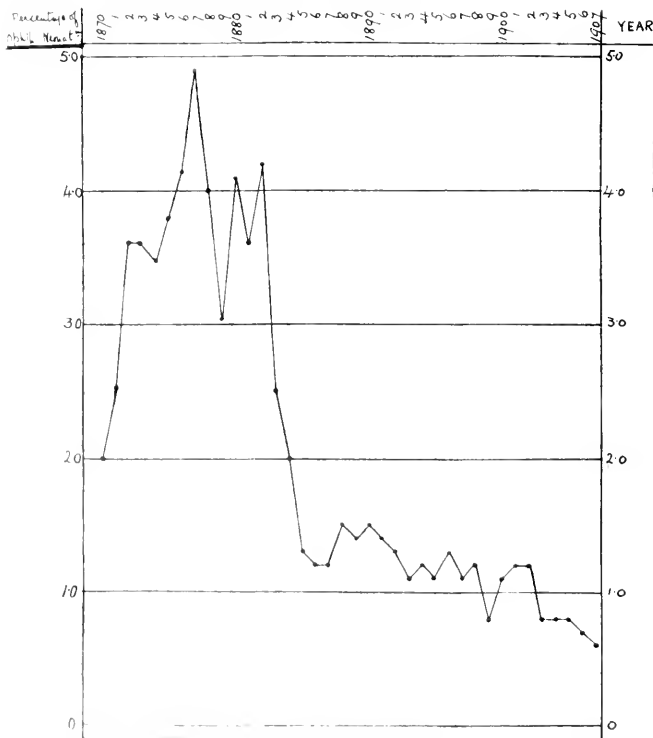
IN last year's January number of *THE OPHTHALMOSCOPE*, Dr. Ernest Thomson draws attention to the alleged diminution of ophthalmia neonatorum, and remarks: "Have we any right to accept unreservedly the optimistic views of Sydney Stephenson on page 19 of his recent and stirring monograph?—Every ophthalmic surgeon will admit that cases of ophthalmia neonatorum are becoming scarcer day by day." As a result of his investigation of the Glasgow Eye Infirmary statistics, Thomson is of the opinion that in Glasgow "ophthalmia is certainly not diminishing day by day."

There is evidently some diversity of opinion, and it is in view of such uncertainty that I take this opportunity of presenting the result of my examination of the Manchester Royal Eye Hospital Reports—

I have collected from the Reports of the years 1870 to 1907 inclusive. The figures are as follows:—

Year.	Total Number of Patients.	Number of Cases of Ophthalmia Neonatorum.	Year.	Total Number of Patients.	Number of Cases of Ophthalmia Neonatorum.	Year.	Total Number of Patients.	Number of Cases of Ophthalmia Neonatorum.
1870	6022	123	1884	14702	358	1896	22346	294
1871	6350	168	1885	15427	340	1897	22050	255
1872	6832	221	1886	15184	198	1898	23300	282
1873	6770	218	1887	16251	200	1899	23016	230
1874	7008	241	1888	16605	206	1900	24135	281
1875	7508	203	1889	17308	200	1901	22973	286
1876	7477	313	1890	18057	270	1902	24478	312
1877	8325	413	1891	18270	202	1903	26342	213
1878	8501	350	1892	17840	201	1904	27610	220
1879	8573	270	1893	18072	243	1905	28273	235
1880	10202	423	1894	18001	215	1906	30447	225
1881	10010	400	1895	21578	368	1907	32613	184
1882	12001	530	1896	20708	344			

From the following chart, constructed from these figures, it will be seen that so far as the Manchester Royal Eye Hospital is concerned, ophthalmia neonatorum cases are diminishing in frequency:—



The sudden fall in 1883 is due, in my opinion, to the introduction of a more efficient prophylaxis in Manchester. It was about this time that serious attention was first given to preventive treatment.

Statistics referring to the corneal complications present when first the infant was brought for treatment may be of interest.

From the year 1882, the first year in which a careful note was taken of the corneal condition of the ophthalmia neonatorum cases, to 1907 there were 7,108 cases of the disease, and the cornea (one or both eyes) was involved in 1,257 instances, giving a percentage of 17.6.

An analysis of the varieties of corneal lesion, including eyes lost, is as follows:—

ONE CORNEA AFFECTED.		BOTH CORNEÆ AFFECTED.	
Eye lost in	136 cases.	Eyes lost in	87 cases.
Hazy	" 243 "	Hazy	" 97 "
Ulcerated	" 288 "	Ulcerated	" 127 "
Perforated	" 132 "	One perforated	" 8 "
Leucoma	" 9 "	Other lost	" 8 "
	—	One hazy	" 23 "
TOTAL	808	Other ulcer	" 37 "
	==	Perforated	" 37 "
		One lost	" 45 "
		Other hazy	" 45 "
		One lost	" 45 "
		Other ulcerated	" 45 "
		One perforated	" 7 "
		Other ulcerated	" 7 "
		One perforated	" 3 "
		Other hazy	" 3 "
			—
		TOTAL	449
			==

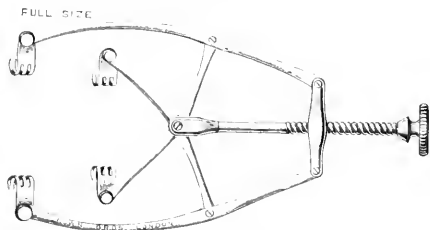
NOVELTIES.

A LACRYMAL RETRACTOR.

MANY surgeons employ one or more retractors during the operation of excision of the lacrymal sac. The Axenfeld and the Muller specula appear to be the favourite instruments nowadays, although, as Dr. F. Harrison Butler has pointed out *THE OPHTHALMOSCOPE*, September, 1908, p. 683, the sharp, fork-like blades of the former are not altogether free from the danger of slipping, and, when impelled by a powerful spring, they might be driven into the cornea.

These instruments undoubtedly facilitate the performance of what is sometimes by no means a simple operation, and they have the further great advantage of controlling the oozing that is apt to prevent a clean dissection of the lacrymal sac. The drawing shows a retractor employed by Mr. Sydney Stephenson, and made by Messrs. Down Bros., Ltd., of 21,

St. Thomas's Street, London, S.E. The instrument (shown of its actual size in the accompanying figure) has four fork-shaped blades, each provided with three pointed prongs. The blades are actuated by the screw, and can be brought into apposition for the purpose of introduction into the wound, and



then separated to the required extent by reversing the action of the screw. The blades are fitted to the arms which carry them by swivel attachments, so that they can accommodate themselves to the shape of the wound as retraction takes place.

REVIEW.

RELATION OF GENERAL AND RETINAL ARTERIO-SCLEROSIS.

BY

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Introduction.

THE last few years have seen a rapidly-increasing interest in all phenomena relating to the general circulation. This is because of the invention of new instruments for the laboratory and clinical investigation of both the blood and the blood-stream. The instruments of Riva-Rocci and Stanton have contributed not a little to the present status of the medical mind on the subject of arterio-sclerosis. Moreover, the influence of the stress of life in this day and generation have so close a relation to many phases of the genesis of arterio-sclerosis as to give it a commanding place in the medical mind.

It is surprising, however, that there remains so much that is obscure and uncertain about arterio-sclerosis, when one reviews the research that has been devoted to it and the seemingly satisfactory conclusions that have been reached in certain directions. The former idea that arterio-sclerosis was simply a process involving the hardening of the vessels that might or might not determine serious disorder of the circulation (namely, cardiac failure, thrombosis, embolism, or vascular rupture) must be laid aside. The present status of the question recognizes that with advancing arterio-sclerosis there is a disturbance of organic functions not strictly confined to the circulation, but involving also digestion, renal action, various nervous mechanisms, and perhaps also the hepatic processes and general metabolism.

There is still much uncertainty as to the exact rôle played by various factors in the production of these vascular changes, but by general consent syphilis is allotted the first place. Following closely after this agent are physical overwork, acute infectious diseases, and auto-intoxication. Lancereaux puts down gout and lead poisoning as the chief factors, while Senator places auto-intoxication first. This seems to be Croftan's belief also, for he affirms that underlying most cases of arterio-sclerosis there is some manner of deep-seated metabolic perversion of undefined origin, that functional inadequacy of important eliminating organs can cause flooding of the blood and tissue-juices with abnormal products, and that many of the latter can raise blood-pressure as well as cause arterial inflammation.

G. Oliver sums the case up well in the following conclusions:—

1. It is misleading to refer arterio-sclerosis to any one cause in all cases.
2. The causes are, as a rule, multiple, although a certain cause or more than one cause may be predominant in individual cases.
3. The leading causes are: (a) persistent supernormal arterial pressure, however induced, and (b) toxins of various kinds, whether generated within the body or introduced from without.
4. In addition to these determining causes, there are certain predisposing factors, such as heredity and trophic proclivities.

Teissier is disposed to ascribe generalized hypertension to some kidney affections but makes the point that if the kidneys are sound, the general hypertension is usually the result of over-functioning on the part of the suprarenal bodies. This latter assumption on Teissier's part is more or less academic and based upon the laboratory fact shown by Janeway that adrenalin chloride used intravenously gives almost immediate rise of blood-pressure, 50 to 100 per cent. greater than that which obtained before its use.

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General and Localized Arterio-Sclerosis.

There is a disposition in many quarters to belittle the value of ophthalmoscopic findings as indicating probable general arterio-sclerosis, on the ground that the latter condition "is never found uniformly all over the body." Jacobi is the author of the above quotation, and his view seems to be shared by many prominent investigators. Collins alludes to angio-sclerosis as a general disease with predilection for certain localities. Janeway states that without involvement of the splanchnics, increased blood-pressure is not the rule in general arterio-sclerosis; while Fremont Smith, after collating a great number of cases, inclines to the belief that arterio-sclerosis is frequently, in its inception, a local disease dependent on acute or chronic infections; he further states that arterial hypertonus exists at times independently of arterio-sclerosis, just as arterio-sclerosis is sometimes in evidence independently of arterial hypertonus. Coats, too, emphasizes the irregular distribution of angio-sclerosis as also the fact that disease of the retinal vessels does not necessarily prove the existence of vascular disease elsewhere, but true to the faith that is in him, he goes on to say that "the retinal changes remain the best indication of the state of the vessels generally which we possess." Compare with the attitude of de Schweinitz in the paragraph on "Beginning Signs.") Friedenwald's series of 24 cases showed one with pipe-stem radials, and yet

only slight change in the retinal vessels, while in three others the general evidences of arterio-sclerosis were slight, but the constriction in the retinal vessels marked. Finally, Rohnier enumerates diminished visual power and colour-sense, narrowed lumen of the retinal vessels, and liability to glaucoma, as the results of generalised sclerosis of the arteries.

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Signs of Incipient General Arterio-Sclerosis.

A list of early signs of general arterio-sclerosis is presented by Josué, which he claims will permit diagnosis in its incipient phases while there is still a prospect of arresting its progress. The arteries are less elastic and contractile, the patient tires easily, is depressed, and occasionally shows intolerance of alcohol and tobacco. Vasomotor, nervous, respiratory, ocular, and auditory disturbances are common, along with epistaxis, cedema, arterial hypertension, and cardiac or renal symptoms. Lessened aptitude for mental work, transient aphasia, unusual irritability, and somnolence are suspicious. Severe morning headache, especially if pulsating, is ominous. Vertigo is the most frequent warning symptom. He lays much stress on the disturbances in the retinal circulation as indicating va-cular disease, and closes by saying "the blood-pressure is not always high during the early stages of angio-sclerosis, but when it is and remains persistently so, generalized arterio-sclerosis is almost invariably present." This agrees with the views of Stengel. Clinical studies in cases that have developed arterio-sclerosis under observation, have convinced him that in the early stages there is a condition of decreased tension, with a tendency to temporary or paroxysmal elevations. He believes (with some pathologists) that the earliest condition is one of loss of elasticity from changes either in the interna or media or both. Besides the reasons given, he bases this view on certain clinical symptoms, such as paroxysmal sweating, variable quantity of urine, and temporary and slight edema. "If," he says, "one trace back the history of cases of rapidly-developed arterio-sclerosis, one will find a gradual development of certain symptoms, such as loss of vitality, decrease of resistance to external conditions, and a tendency to slight infective ailments, nervous depression, various organic derangements, and moderate circulatory disturbances. He recognises three types—nutritional, neurasthenic, and nervous. The reviewer is particularly impressed with the three stages of angio-sclerosis he describes, namely:—

1. A preliminary one, difficult of recognition in its beginnings, and confusing to the clinician in his efforts to distinguish the part of the ætiologic factors from that of the arterial disease in the symptom-complex.

2. A middle period, during which the arterial disease is easy to recognize, but in which secondary organic changes have a rôle of variable importance.

3. A final stage of failure of circulation, organic failure, and terminal infections.

It is the belief of the reviewer that routine searching examinations with the ophthalmoscope in the first or preliminary stage above-mentioned, might help to establish a definite position or negative diagnosis in such cases.

Stengel himself has said that "the ophthalmoscope may reveal the positive evidence of vascular disease before the general angio-sclerotic condition has

become marked." This brings us to the consideration of the beginning retinal signs of angio-sclerosis.

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Beginning Signs of Retinal Angio Sclerosis

In approaching this phase of the subject it is well to bear in mind the following basic facts :—

1. Primary arterio-sclerosis as a part of (and oftentimes a herald of) general arterio-sclerosis, is not uncommon in the retina.

2. Only very small vessels are involved (some of the smallest in the body), so that the grosser changes in the media and adventitia which occur in the larger vessels of the body, do not come under discussion.

3. As the vessels diminish in size, such media as exists is the first layer to disappear.

4. The veins are little more than connective tissue tubes, rich in elastic fibres and lined with endothelium.

5. What capillaries there are resolve themselves into mere endothelial tubes.

6. Lymph-vessels are found only in the perivascular spaces around the blood-vessels.

7. These blood-vessels lie within the nerve fibre layer between the internal limiting membrane and the ganglion cell layer, in contact with the non-medullated axis cylinder processes of the ganglion cells, and this proximity has much to do with the pathology of these structures.

8. The retinal arteries, being end-arteries, would be among the first to yield under high arterial tension when affected with angio-sclerosis.

9. They are on the internal carotid system of vessels and may be considered as frequently indicating a similar state of the small end-arteries in the cerebral cortex.

10. The walls of normal retinal vessels are invisible in that they are practically of the same index of refraction as the similarly invisible retina itself.

11. Of the three organs containing end-arteries (the eye, the brain, and the kidney), the first-named is the only one that offers opportunity at first hand for the study of such a circulation, and that too under a magnification of from 10 to 14 diameters.

In the earliest indications of persistent high arterial tension, when this is a symptom of angio-sclerosis, de Schweinitz prefers the term "suggestive," and divides the eye-ground lesions in arterio-sclerosis into those which are "suggestive" and those which are "pathognomonic." Under the earliest indications, he includes uneven calibre and undue tortuosity of the retinal arteries, increased distinctness of the central light-streak, an unusually light colour of the breadth of the artery, and alterations in the course and calibre of the veins. He lays particular emphasis on (a) the markedly corkscrew appearance of certain arterial twigs, either of those which skirt the macula, or more significantly, of one or more small branches which arise from the larger vessels of the main distribution, which themselves are apparently normal. In other words, as long since noted by R. M. Gunn, the whole artery is not affected. This corresponds to Alleman's first group in which what he happily calls 'kinkiness' of the vessels, is the main sign. (b) Flattening of

a vein where it is crossed by an artery. The vein is only slightly compressed at this stage, but not really indented. This appearance is a little more frequent in the inferior distribution. This corresponds to Alleman's second group of cases. c. The nerve head has an appearance often loosely described as "congested." But this appearance differs from that presented by the so-called streaked hyperopic disc; it is unlike the flannel-red surface of the papilla which merges into an equally flannel-red eyeground, so commonly the result of prolonged eye-strain, exposure to bright light and intense heat, or as seen in certain constitutional conditions; and, finally, may be distinguished from the early stages of neuritis with the somewhat juicy red aspect of the disc. It is a dull-red appearance which is presented and differs somewhat from the franker congestions as the unhealthy flush of a cheek differs from the bright color of a normal blush. E. Jackson also lays much store by this "brick-red" nerve head, as one of the early indications of retinal arterio-sclerosis. The reviewer, however, is on record as feeling that this sign is probably more intimately associated with the established or pathognomonic signs. In the same communication he suggests that, inasmuch as the iris is an almost purely vascular membrane and the ciliary body likewise, it is altogether likely that sluggishness in pupillary reaction and abnormal recession of the near point, may both yet become recognized as among the early signs of ocular angiosclerosis.

There is much in the contention of Suker, that when angio-sclerotic changes in the fundus are suspected, it is advisable to examine the same under varying intensities of light, to begin with a low illumination, and gradually to increase until the maximum is reached. Many of the incipient changes are, to his way of thinking, not at all visible with a maximum illumination, while what might be called a preretinal haze is frequently detected by quite a low illumination, as also fine changes in the choroid and retina. The reviewer has this same feeling, that while the value of varied illumination in ophthalmoscopic work has long been known, it is not being resorted to as it once was, and it is a manoeuvre of special value in the study of incipient changes in the retinal circulation.

At this point we may well consider the value of the methods employed by the general clinician in the recognition of the early stages of arterio-sclerosis. According to Stengel (*loc. cit.*), these consist mainly of the condition of the pulse, the character of the heart sounds, the tracing on the sphygmogram, and the readings of the sphygmotonometer, and they are named by him as the four principal indices of persistent high arterial tension. Foremost among these to-day, is the reading of the sphygmotonometer, which has been welcomed in many quarters as an instrument of real value. Janeway in the introduction to his voluminous work on "Blood-Pressure" trenchantly asks—"does the sphygmotonometer yield accurate information which can be had in no easier way? Second: Is this information worth the time expended in obtaining it? His answer to his own question, is, "that five minutes' trial will convince the most sceptical that his previous judgments based on his supposedly trained sense of touch were often fallacious." To the second question he replies "The value of a knowledge of the actual blood-pressure in a particular case must depend largely on the observer's acquaintance with the physiologic and pathologic causes for variation. With this information, diagnosis, prognosis, and therapy cannot but gain in efficiency through blood-pressure determinations at the bedside or in the office." He directs attention to two important facts: a) The elastic distensibility of the arterial wall decreases with increasing tension; (b) The diminishing distensibility and sharp rise in pressure at every systole of the ventricles introduces another

danger, that of rupture. For the normal individual, Janeway gives 80 to 160 mm. as the systolic limits, adding his belief that with the 12 cm. cuff, 145 mm. will prove nearer the absolute value. In the great majority of young males 100 mm. to 130 mm. will be found, females tending to have a lower pressure of 10 mm. with the same limits. In children the limits are the lower ones usually found for adults. Potain puts down 140 mm. to 210 mm. as the normal limits, while v. Basch (both quoted by Janeway) makes 110 mm. to 140 mm. the normal.

It will, therefore, be readily seen that the wide limits set down result more or less from individual interpretation. So that the personal equation must enter very considerably into this phase of the problem.

Stengel does not help to clear the situation for either the clinician or the ophthalmic surgeon when he says:—"If the four symptoms I have named (the condition of the pulse, the character of the heart sounds, the increased tidal wave on the sphygmogram, and the elevation of tension rendered by the sphygmotonometer) were found *in arterio-sclerosis alone*, the problem of diagnosis would be greatly simplified, but this is not the case. There are numerous and varied conditions of the system, organic and nervous in origin—that elevate pressure nearly constantly, and in which arterio-sclerosis has no part, except perhaps as a consequence. Any one of the conditions may occasion the four signs I have discussed."

For these reasons de Schweinitz is abundantly justified in saying "So far as I am aware, the ophthalmic signs which have been detailed are produced by no other condition except the persisting high arterial tension of angio-sclerosis, and therefore eye-ground examination is of paramount importance in the early recognition of vascular disease, and may render signal aid in the interpretation of symptoms caused by the derangement of the functions of important organs, which, in turn, are dependent upon sclerotic changes in their smaller vessels, although there is yet no decided alteration in the general circulation." Closely bound up with the foregoing, is Meig's finding that the blood-vessels of the viscera are more liable to have the intima diseased than the vessels which serve to carry the blood from part to part. In the discussion of Black's paper before the American Medical Association, in 1908 (on the "Relation of Ocular and Cardiovascular Disease"), de Schweinitz declared his belief that the "ophthalmoscope equalled, if not surpassed, any of the well-recognised methods for the detection of angio-sclerosis, and he thought its findings—unlike those of the sphygmogram and even the sphygmomanometer—diagnostic if positive. No one was prepared to say that in the absence of ophthalmoscopic changes, there must be absence also of arterial degenerative changes, but in the presence of the former, other things being equal, and local changes in the eye being excluded—the findings, if positive, were diagnostic." Coats, too, believes that the retinal changes remain the best indication of the state of the vessels which we possess.

So that, so far as early or suggestive signs are concerned, there seems pretty general agreement that kinkiness of the small vascular twigs, and flattening of one or more veins at the crossings, and probably a brick-red nerve head, are reasonably sure signs in a goodly percentage of cases of beginning angio-sclerosis in the internal carotid system of vessels.

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Established Signs.

It is surprising how little difference of opinion there is as to the established signs of retinal angio-sclerosis. The latest investigation in this direction is that of Fox and Batroff, who in 100 cases of retinal hæmorrhages from dispensary and private practice, studied the blood-pressure, the blood-count, and the urine. In 80 per cent. of these cases, hypertension was found—whether persisting or not is not noted. Forty per cent. were associated with chronic interstitial nephritis, 27 per cent. with angio-sclerosis pure and simple, 13 per cent. with chronic parenchymatous nephritis. Secondary syphilis was the cause in but 2 cases. Preston, Friedenwald, Hirschberg, Gunn, Raehlmann, Bull, Alleman, Woodruff, Black, E. Stevens, de Schweinitz, Vennemann, Röhmer, Frost, Reimar, Hertel, and Fox and Batroff, practically agree as to changes mentioned. de Schweinitz, who prefers to call them "pathognomonic," catalogues the following:—changes in the size and breadth of the retinal arteries producing beading, distinct loss of translucency, decided lesions in the arterial walls, such as white stripes in the form of perivasculitis, alternate contractions and dilations of the veins and particularly the most important sign—indentation of the veins by the stiffened arteries in the same manner as a solid rod would indent a rubber tube when lying across it. Sometimes the vein is simply flattened slightly at the point of crossing, or merely pushed aside, or its calibre contracted so that beyond the crossing there is a slight dilatation of the vein. These are the usually accepted signs, but there may be also white stripes along the veins, the latter being tortuous and even varicose at times. Among the later and grosser lesions are retinal edema appearing as a greyish mist about the disc or following some one or more of the vessels, linear flame-shaped hæmorrhages, or occasional small round ones. This includes all the signs usually met with. Gross hæmorrhages are infrequent, and marked degenerative lesions indicate grave general disturbance.

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Relation of Age to Angio-sclerosis.

Gunn was one of the first to insist that old age is not alone productive of these changes. Indeed, recent years have brought forth evidence to show that angio-sclerosis may be found in children. In 1,477 sections on all ages and

conditions. Romberg found *post-mortem* evidence of angio-sclerosis in 2 instances before the 14th year, and 6 per cent. between 15 and 19 years with diffusely thickened arterial walls. Thayer in 189 individuals who had long before recovered from typhoid, found 48 per cent. between 10 and 50 years with palpable arteries, as against 17.5 per cent. in ordinary individuals.

This is in accord with Alleman's findings in the retina. In 40 cases of retinal angio-sclerosis, 1 was but 10 years of age, 6 between 10 and 20, and 25 between 20 and 30 years of age. The reviewer has recorded cases in a 29 and a 35 year old woman. de Schweinitz has seen them pronounced as early as 37, but leans to the opinion that the visible retinal changes usually begin between 40 and 50. At all events, enough evidence has been recorded in general and ophthalmic literature to put every ophthalmic surgeon on his guard for early cases.

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Prognosis.

The outlook in such cases is twofold—that which affects the patient's life expectancy, and that which affects vision and the welfare of the eye. Greenwood insists that the importance of retinal arterio-sclerosis is not ordinarily recognised, that, indeed, it is often overlooked or if observed, only given a passing thought unless of a degree sufficient to cause a grave lesion of the retina, and then looked on as a progressive disease that treatment will not stay nor alter. Nettleship affirms that an early stage of granular kidney may be reasonably suspected when decided thickening of the retinal arteries is seen, and that the suspicion will be much strengthened if the patient be comparatively young.

J. T. Carpenter catalogues six cases with established signs of retinal angio-sclerosis that all died soon after with apoplexy. The chief difficulty is with the type of case described by Greenwood, in which there is retinal disease (which should properly be called angio-sclerotic retinitis) where the distinctively degenerative condition of the retina results from the angio-sclerosis (itself a manifestation of general arterial disease), with so slight an involvement of the kidney vessels that no albumin is found on repeated examination, the amount of urea normal, and it is clearly evident that the arterial disease is primary and not due to uræmic poisoning. Of these Alleman says "the widest possible variations exist as to general manifestations and in some instances no indications of ill health are experienced by the patient. The condition is rather one of rapid progress toward senility, and frequently no sign is given of any departure from the normal health until the final catastrophe effects a permanent cure." This is a fairly good description of the final state of many Americans whose utter devotion to the rush and bustle of American business and social life produces a condition that might well be termed "Americanitis"—reproachful as it sounds. "Other patients," says Alleman, "advance over the same road, perhaps more slowly, but ever hand in hand with the physician whom they render only less miserable than themselves. Their state is one which has been described as "the habitual enjoyment of ill health, tempered with overwhelming exacerbation of misery usually excited by the digestive tract."

Straub is authority for the statement that the prognosis as to life is not

bad in the youngest and oldest cases, but very bad in the intermediate ages. The prognosis as to vision is graphically illustrated in one of de Schweinitz's cases—a woman, of 58, who consulted him simply for a refractive error. Vision rose to sharp 6 5 with a proper correction. The media were clear and the fundi normal, save for moderate indentation of the veins in the inferior distribution. One month later the patient suffered a slight indigestion and a blur before her left eye, when the ophthalmoscope showed large hemorrhages in the inferior eye-ground, with some small dotted hemorrhages scattered elsewhere. Her systolic blood-pressure was then found to be 190, diastolic 130. de Schweinitz properly questions whether, if the retinal pressure had been taken at the first observation, she would not have been spared the retinal hemorrhages.

The breadth of the subject, its importance to the ophthalmologist, is strikingly shown by Ed. Jackson's case of a 58 year old man whose vision at the time of the first visit was 4 22 and 4 12. There was dilatation of the veins, with narrowing at the crossings. Color-perception was markedly interfered with. The patient's systolic pressure was but 140. Considering the condition of his veins, Jackson inferred that the pressure, while absolutely low, was temporarily low for that individual. The internist, to whom the case was referred, found marked dilatation of the heart. Urine normal. Here, as Jackson says, was the practical point. Within three months, on restricted diet and medicinal treatment, the patient's vision had risen to 4 5 in each eye, but within a year he died of apoplexy. Two years ago the reviewer saw a 51 year old man, seemingly in good health, who had never smoked drunk, nor chewed, and had always lived a well moderated life. He was not engaged in laborious work. With the correction the vision was normal. The ophthalmoscope showed a brick-red nerve head, tortuous macular arteries, uneven and badly indented veins, and much engorged lymph sheaths, amounting to perivasculitis. The urine showed slight albumen, decided indican, and urea 2 3 per cent. Blood-pressure: systolic 230, diastolic 190. Coagulation time 2 20. Three months later the patient was stricken with apoplexy. Most striking of all is de Schweinitz's case of a 48 year old schoolmaster whose vision was normal after correction of the refractive error, for which he had applied to the reporter. "It was noted that the veins were somewhat uneven and distinctly pressed upon and there was a little brick-red congestion of each disc. The patient was apparently in perfect health. Within two weeks after his visit he was suddenly seized in the night with a large cerebral apoplexy and died without returning to consciousness." Again de Schweinitz asks "had the arterial tension been measured and the man been taken from his arduous active duties, and at once placed on a rigorous dietetic and medicinal regimen, is it not likely that the apoplexy might have been averted?" Finally, Talbot Jones draws a graphic picture of the increasing mortality from arterio-sclerosis, together with its almost whimsical neglect as a mortality factor and concludes his article by declaring that arterio-sclerosis is to-day the greatest foe of the great life assurance companies.

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Treatment.

II. A. Hare lays down the broad generalisation that the cardiac stimulants are not needed in these cases as much as rest and the skilful use of alteratives and vascular sedatives. In cases of high tension due to fibrosis, the nitrites, he claims, can be of but little value, while iodides are useful. This is in line with Lamb's observation as to the selective action iodide often exhibits over connective tissue. He later on suggests dionin in such cases, but unless his object is to deplete the anterior ocular circulation and thus temporarily ease up the intraocular pressure, it is difficult to understand what beneficial effects he expects from it.

Senator, believing that auto-intoxication is the most frequent cause of angio-sclerosis, pins his faith to hydrotherapy and general measures. The reviewer's own ideas are fairly close to Senator's. He has seen very few such cases that did not exhibit autotoxemia as a soil at least on which the angio-sclerotic condition develops. Because of these things, he achieves elimination by the hypodermatic use of pilocarpin, either daily or three times weekly, combined with rest in bed. This has proven far and away the most efficient method in his hands.

Winternitz naturally extols combined hydrotherapy and dietetic measures, and shows some fine results. Among unusual suggestions are those of S. S. Cohen, who says: "Clinically we know that in certain cases of angio-sclerosis, thyroid substance will produce amelioration of symptoms, and both clinically and experimentally we know that there is a certain degree of antagonism between the thyroid and the adrenal secretions, which latter substance in its chromatin properties is a blood-pressure raising agent." There may be something in this suggestion for the incipient cases. There is also food for thought in the outcome of Harbridge's case of spasm of the retinal vessels which was repeatedly studied with the ophthalmoscope. The spasms continued in spite of all the known general measures until salines were heroically applied when the vascular spasm ceased and was not again observed at any time. Finally, note should be made of Fox and Bartroff's return to the old-fashioned method of venesection. They conclude from their observations that venesection has proven of value, not only in reducing dangerously high pressure but in acting as a powerful stimulus to a speedy absorption of retinal hemorrhages.

In conclusion, we may report Sir Clifford Allbutt's sound advice, that "every adult of, say, 45 years and over should at intervals of two to three years, have his blood-pressure taken, in the hope that it may guide his physician to use every endeavour to postpone or prevent the onset of arterio-sclerosis." According to comparative anatomy or zoology, man is entitled to live 100 years. And as longevity is set down by Osler as a question of vascularity, it behoves all ophthalmic surgeons to be wary of even the slightest changes in the retinal circulation, which is the only visible circulation in the human body.

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CURRENT LITERATURE.

NOTE.—Communications of which the titles only are given either contain nothing new or else do not lend themselves to abstract.

I.—DACRYOCYSTITIS NEONATORUM.

1. Ollendorff.—Congenital suppuration of the lacrymal sac. *Die Ophth. Klinik*, 20 January, 1907.
2. Mayou, M. S.—Lachrymal abscess in the new-born. *Royal London Ophthalmic Hospital Reports*, January, 1908.
- (3) Zentmayer, William.—Imperforation of the lacrymo-nasal duct in the new-born, and its clinical manifestations. *Journ. American Medical Association*, 18th July, 1908.

(1) Ollendorff describes seven cases of dacryocystitis in infants, which he regards as being of congenital origin. The experience he has had in dealing with these cases has led him to adopt the following line of treatment: massage of the sac for a few days, not longer than a week; if not successful, Bowman's probe No. 2 should be used once. It is not necessary to use the probe more than once. Warm fomentations may follow the probing with advantage.

PERCIVAL J. HAY.

(2) Mayou (London) has recently had an opportunity of treating eight cases of lacrymal abscess in the new-born, and in doing so has worked out some points in the development of the lacrymal passages and their condition at birth. He has also conducted experiments with regard to the causation and position of the abscess.

Development.—The material included eight fetuses, believed to be from 10 weeks to 5 months old, besides 5 term fetuses. They were hardened in formol, embedded in celloidin or paraffin, and cut in series. Mayou's investigations lead him to believe that the canaliculi are formed shortly before the tenth week by an infolding of the epithelium of the lid-margin. At the tenth week they consist of solid columns of cells, which open into the lacrymal sac. At the twelfth week the canaliculi possess a well-marked lumen, but at birth the lumen is almost occluded by epithelial cells, many of which are degenerated and desquamated. The lacrymal sac and duct are developed in the facial cleft as an epiblastic infolding. The lower end of the duct (the first part to undergo differentiation) does not acquire a lumen until the fourth month of foetal life. The lower end of the duct becomes gradually surrounded by bone. The lacrymal sac, however, practically never loses its lumen, and is the last part of the facial cleft to close. Even at birth there is a certain amount of connective tissue around the lacrymal duct.

Anatomy at birth.—The anatomy of the parts at birth was studied by means of sections through three foetal heads, hardened, frozen, and cut with a fine saw. The lower end of the duct will barely admit a fine bristle. The opening is slit-like and partially occluded by the pressure of the inferior turbinated bone. The duct is filled with *debris* both from the sac and the canaliculi, and at birth is either not patent at all or only partially so. The lacrymal duct at birth does not measure more than 7mm., and its direction is much more backwards than in the adult, a probe making an angle of about

45 degrees with the forehead when introduced through the duct. In order to test the patency of the duct at birth, injections of coloured jelly were made into the ducts. In two of four experiments the fluid failed to reach the nose, and became extravasated in the same region as that in which a lacrymal abscess is formed. In the other two cases the fluid reached the nose only after prolonged syringing. Forceful injections always resulted in extravasation. After birth the nose speedily becomes cleared by aspiration, but at the lower end of the lacrymal duct the process probably occupies some time before it is complete. No trace of a normal "cartilage" (as premised by Donald Gunn) could be found in the nose of the child at birth.

The frequency of infection of the sac in cases of lacrymal obstruction, Mayou thinks, is owing to the liability of infants at birth to infections of the conjunctival sac. One of the peculiarities of a mucocele in the baby is the large dimensions it may attain without showing much external evidence. This was attributed by Donald Gunn to dilatation of the duct, but Mayou shows that it is due to the peculiar anatomical conditions in the newly-born. The organisms found in the purulent contents of the abscess were: 1. gonococcus; 2. staphylococcus; 3. pneumococcus; and 4. Morax-Axenfeld diplobacillus. Pure cultures obtained in no single instance. The treatment adopted was to cleanse the sac and to pass a probe. SYDNEY STEPHENSON.

(3) **Zentmayer** (Philadelphia) has obtained such successful results in the disappearance of this type of trouble from single probings (it having been necessary in but a single instance to repeat the procedure, that he recommends the method. He does not employ an anæsthetic, and takes care to follow the ordinary route of the canal at the age of the patient.

C. A. OLIVER.

II.—COLLAPSE OF SCLERA IN CATARACT EXTRACTION.

(1) **Sirieys**.—Collapse of the sclera during cataract operation. *La Clinique Ophthalmologique*, 10 fevrier, 1908.

(2) **Blanco**.—Collapse of the sclerotic after the operation for cataract. *Arch. de Ocul. Hispano-Americanas*, Marzo, 1908.

(1) This rare accident, or perhaps incident is a better term, in the course of cataract extraction receives attention by **Sirieys** Figeac, who happened to have two cases in rapid succession. In each of these delivery of the lens in the ordinary way was impossible owing to folding of the sclera and gaping of the wound, and in each of them it was removed by Snellen's vectis without any loss of vitreous. The post-operative results were normal. Regarding the cause of this phenomenon, Sirieys does not think that Chodin's explanation—congenital want of scleral elasticity—is capable of accounting for the collapse and diminution of volume of the eye. He considers that under the influence of cocaine, especially in old, decrepit subjects with very ripe senile cataracts which have matured very slowly, the vitreous becomes concentrated and retracted. He looks for remedy to the use of solutions of cocaine weaker than 5 per cent. instilled not more than three times, the operation to be commenced as soon as possible. The removal of the cataract with the vectis is the best thing to do. The eye is so soft there is no reason to fear loss of vitreous. ERNEST THOMSON.

(2) In **Blanco's** case incision of the cornea was at once followed by expulsion of the lens. Vitreous did not issue, and the eye was closed.

On removing the bandage, forty-eight hours later, the eye was found to be completely collapsed, although the dressings were dry. Blanco supposed that there had been escape of vitreous, and he regarded the condition as hopeless; but the eye resumed its normal size during the next two days, and eventually made a good recovery. Vision excellent.

HAROLD GRIMSDALE.

III.—FŒTAL BLOOD-VESSELS IN THE EYE.

Ruhwandl, F.—Extensive remains of fœtal blood-vessels in the eye. (*Ausgedehnte Reste der fötalen Augengefäße.*) *Zeitschr. f. Augenh.*, März, 1906.

Ruhwandl recounts a case which presented the following anomalies.—The eye was not microphthalmic, having a H. of 1.0 D. On the anterior lens capsule a few fine pigment spots; in the posterior layers of the cortex, fine opacities composed of numerous threads, which crossed and joined each other at all angles. On the posterior lens capsule, a slighter but similar opacity and a few pigment spots. From the centre of the lens to the point of division of the retinal arteries on the disc ran a thick cord-like structure, from an enlargement of which near the disc two fine threads hung free in the vitreous. On the temporal side of the disc was a white patch bounded by a deeply pigmented line. The explanation of the appearances here seen is that of a persistent hyaloid artery with persistence of some of its peripheral distributions to the lens and of two of its vitreous branches, none of them permeable.

A. LEVY.

IV.—THE RELATION OF HEADACHE TO AFFECTIONS OF THE EYE.

Risley, Samuel D—The relation of headache to affections of the eye. *Pennsylvania Medical Journal*, December, 1907.

As a result of a careful study of this subject, made from the point of view of the ophthalmologist, **Risley** (Philadelphia), has arrived at the following conclusions:—1. That ocular disease or anomalies of the ocular apparatus are in a large group of patients the sole and sufficient cause of headache. 2. That abnormal visual conditions may be the unsuspected cause (therefore, that the absence of symptoms obviously referable to the eyes, does not exclude them as an etiologic factor in headache). 3. That, notwithstanding the congenital origin of many ocular anomalies, the sudden onset of headache, coming on during or after middle life, or after attacks of acute disease, or during the ravages of some general dyscrasia, does not exclude the eye as an etiologic factor. 4. That the participation of the eyes as a probable cause of headache, and a considerable group of associated symptoms, can be positively excluded only in the proved absence of ocular disease, or after the most painstaking correction of any existing error of refraction or abnormality of binocular balance. 5. That, in many cases, prolonged eye-strain sets up

pathologic states in the fundus oculi which require, like other inflamed tissues, time for recovery after removal of the cause (therefore immediate relief of symptoms is not always to be expected). 6. That the existence of some general affection, *e.g.*, gout, rheumatism, syphilis, or diabetes in any of their protean manifestations or results, does not exclude the eyes as the immediate cause of an associated headache, since the accompanying ocular disease, *e.g.*, iritis, choroiditis, glaucoma, etc., may be the direct cause of the pain in the head, to relieve which local treatment also will be required; and 7. that the existence of congenital ocular defects is especially prone to be the occasion of headache and other reflex neuroses in individuals with impaired vitality, whether inherited or acquired by faulty living or by daily toil in a bad hygienic environment.

CHARLES A. OLIVER.

V.—HAIDINGER'S TOPS.

Fortin.—The examination of central vision by means of the tops of Haidinger. (*Sur l'examen de la vision centrale par le moyen des houppes de Haidinger.* *Recueil d'Ophthalmologie*, février, 1908.

In looking through a Nicol's prism at a uniform surface, such as a clear sky or a uniformly grey cloud, a small, yellowish bundle arranged hyperbolically like a horn-glass or a diabolo spool, and known as Haidinger's tops, may be noticed by those who know, however, where to look for it. Fortin has been able to make them visible to people of average intelligence by insisting further that the attention be strictly directed to the point of fixation, and that the prism be slowly but continually rotated on its axis. They can be made visible still better when a Cooper-Hewitt mercury vapour tube is observed through several layers of cobalt glass, when they appear deep blue on a clear ground. They appear more distinctly when the axis of the Nicol is parallel to the horizontal diameter of the eye.

In Fortin's opinion the top represents the macular opposed points of the tops, the centre of the fovea, the point of fixation or visual line. He considers that Haidinger's tops are intimately related to the phenomena of adaptation and retinal fatigue for blue. In cases of macular disease Haidinger's tops cannot be seen, and the prism can thus be made a useful instrument in the differential diagnosis of macular from para-macular lesions. It is necessary that the patient be possessed of a fair amount of intelligence to observe the phenomenon. When the patient can see it with one eye and fails with the other, the presence of macular disease may be considered proved.

J. JAMESON EVANS.

VI—ACCESSORY NASAL SINUSES AND DISEASES OF THE EYE.

Discussion on the relation of disease of the accessory nasal sinuses and diseases of the eye.—Report of Proceedings of Section of Ophthalmology at the Sheffield Meeting of the British Medical Association. *British Medical Journal*, September 12th, 1908.

Logan Turner's (Edinburgh) remarks in opening the discussion are mainly anatomical. It is more appropriate to regard the nasal accessory sinuses as

accessory to the orbit than to the nasal chambers. Studied in relation to the orbit we have, anteriorly, the frontal sinus and anterior ethmoidal cells occupying to a varying extent the anterior part of the roof of the orbit. The anterior ethmoidal cells are in intimate relation to the anterior part of the inner orbital wall, while the maxillary sinus lies both anteriorly and posteriorly beneath the orbital floor. The posterior ethmoidal cells and the sphenoidal sinus have a constant relationship to the inner wall of the posterior part of the orbit. Affections of the anterior group of sinuses may be responsible for bulbar affections, those of the posterior group for certain retro-ocular affections.

George Mackay (Edinburgh) paid a tribute to the value of the April, 1908, number of *THE OPHTHALMOSCOPE*, which devoted a great deal of space to this subject, largely neglected in text-books. There is much evidence that a large proportion of cases of idiopathic orbital cellulitis and of orbital abscess have their origin in diseases of the nasal accessory sinuses, and also that the eyeball and its appendages may be affected in a more solitary manner. He divided the cases into four groups. **GROUP I.**—*Mucocelles*, in which owing to occlusion of the outlet, a sinus becomes filled with retained secretion which remains sterile, require surgical treatment. This Mackay considers is within the province of the rhinologist. **GROUP II.**—*Sinusitis*, acute or chronic, accompanied by external signs of orbital cellulitis, abscess formation, tumour growth, œdema of lids, or apparent dacryocystitis. The causes may be coryza, influenza, pneumococcic, diphtheritic, streptococcic, erysipelatous, or the more chronic tuberculous and syphilitic infections. In the case of the antrum the irritation may be due to decayed teeth, while any of the sinuses may be involved in injuries, or give lodgment to benign or malignant neoplasms. An empyema of any of the sinuses may be open or closed, according to whether the ostium is open or closed. Inefficient surgical treatment of mucocoele may lead to its becoming an empyema. Birch-Hirschfeld has stated that out of 684 cases of orbital inflammation, 59·8 per cent. were due to accessory sinus inflammation. The frontal sinus was the starting point in 29·8 per cent., the maxillary in 21·8 per cent., the ethmoidal in 20·5 per cent., the sphenoidal in 6·1 per cent.; several sinuses were together affected in 14·7 per cent. The possibilities as to the way in which inflammation is conveyed from sinus wall to orbital contents include septic thrombosis or thrombophlebitis, or lymphangitis, or a gradual erosion of the bony partition. Sometimes a *sub-periosteal* abscess may burrow forwards or backwards, and should, if possible, be evacuated by an incision which does not open up the orbital cellular tissue, but seeks the pus by following the bony wall from the anterior orbital edge. In **GROUP III** we have sinusitis without external signs of orbital inflammation, but (a) with ophthalmoscopic signs, such as optic neuritis, thrombosis, etc., (b) without ophthalmoscopic changes, but with disturbances of vision, such as central scotoma or limitations of the F. of V., paralysis of ocular muscles, or fifth nerve disturbances. In addition to palsies of ocular muscles and neuralgias relieved by sinus treatment, another interesting association has been found in the occasional occurrence of glaucoma. **GROUP IV** includes ocular affections in which the nasal connection has not been so clearly established, such as affections of cornea, iris, choroid, opacities of lens and vitreous. Mackay concluded by saying that he looked for an expression of opinion as to the relative position of rhinologists and oculists in the surgical treatment of these cases.

St. Clair Thomson (London) spoke on thrombosis of the cavernous sinus, of which the cause is generally nasal or aural, and the most prominent symptom ocular. The most common cause of thrombosis of the cavernous

sinus is disease of the sphenoidal sinus. Next comes pyogenic infection from the ear. Infection *via* the ophthalmic vein and its branches would appear to come third. Common symptoms are those of meningitis, pyogenic temperature, rapid pulse, profuse perspiration, rigors, headache, sickness, lethargy, delirium, drowsiness, coma, convulsions, inflammation of the glands of the neck, swelling of the palate or of the cheek. The chief ophthalmic changes were 1. papillary oedema, 2. chemosis, and 3. exophthalmos. They developed from six to sixteen days after the onset of symptoms indicating the spread of infection.

Sydney Stephenson (London) described a fatal case of cavernous sinus thrombosis.

Axenfeld (Freiburg) desired to impress the fact that acute affections of sinuses sometimes heal spontaneously by means of evacuation of their contents through the natural openings, while the orbital diseases started by the sinus disease, may persist or increase owing to inflammatory changes taking place in a closed cavity. Thus it happens that at times the offending sinus may appear to be healthy. It is possible that a passing catarrhal affection of the periorbital sinuses may be more often the cause of optic-nerve disease than is usually supposed. In the cases in which the cavities are not separated by bone from the sheath of the optic nerve, this is particularly likely to occur. Axenfeld stated his opinion that the modern ophthalmologist should be capable of operating on the periorbital sinuses.

Adolf Bronner (Bradford) said the most dangerous cases of sphenoidal sinus disease were those in which there was not free drainage, and these cases were often difficult to diagnose. He had seen numerous cases of cavernous sinus disease due to sphenoidal sinusitis in which the latter had seemed to be normal. It was very remarkable that suppurative disease of the eyeball so rarely gave rise to cavernous sinusitis.

Ernst Fuchs (Vienna) said that in some diseases of the ethmoidal and sphenoidal sinuses causing orbital disturbance nothing was to be found by simple inspection of the nasal cavity, but if the orbital symptoms were sufficiently marked to indicate sinus disease, they should insist on opening the sphenoidal sinus from the nasal cavity, and in some cases it would be found that it was filled with lymph or granulation tissue.

Logan Turner, in replying, expressed the opinion that an ophthalmologist should not incise and drain a sinus, but that a rhinologist should make a permanent drain into the nasal cavity. ERNEST THOMSON.

VII.—EXAMINATION OF THE EYES IN EPILEPTIFORM ATTACKS.

Rodiet and Bricka.—The advantage of examination of the eyes in cases of epileptiform attacks. *De l'intérêt de l'examen des yeux dans les cas d'attaques épileptiformes.* *Recueil d'Ophthalmologie*, septembre, 1908.

Rodiet and Bricka draw attention to the value, for diagnosis and treatment, of ophthalmoscopic examinations in cases of generalised or localised epileptiform attacks following falls on the head and lesions of the brain or spinal cord from alcoholism or syphilis.

Two interesting cases are cited in illustration :—

CASE 1. A woman, aged 60 years, an inmate of an asylum owing to maniacal delirium of alcoholic origin, and hallucination of taste and smell. Thirty-two years previously she had shown some symptoms suggestive of syphilitic infection, and six years before admission, developed convulsions in the upper extremities and some attacks of vomiting. These convulsions lasted about a week, but recurred again a year after admission into the asylum, and they were then limited to the face and were followed by paresis of the face and tongue and defective speech. Later, the type of the epileptiform attack became facio-oral, the left lower extremity being affected as well as the face.

Ophthalmoscopic examination showed grey atrophy of the discs, which were of a dirty-yellow colour, dilated and tortuous vessels, and slight pigmentation of the retina. *Post-mortem* examination of the brain showed irregular thickening and adhesion of the dura mater with numerous pearly meningeal plaques, a very thick one being placed over the right para-central lobule. The right Sylvian artery was irregularly thinned and aneurysmal, and felt parchment-like, inelastic, and fragile.

CASE 2. A female inmate of the asylum, aged 45 years. Alcoholic, with history of syphilis 20 years previously. Hallucinations of sight and hearing, and alterations in general sensibility. Ideas of grandeur and persecution. Four years after admission she developed Jacksonian epilepsy, followed by temporary paralysis in the right arm, and also signs of pulmonary tuberculosis. Ophthalmoscopic examination showed a dirty yellow disc, dilated and tortuous vessels, and retinal pigmentation on the left side, and a limited optic neuritis with retinal pigmentation on the right.

At the autopsy, a scene of gummata, about the size of hazel nuts, were found on the surface of the brain, and three of these were grouped together on the motor area for the right arm. Histologically, the optic nerve and retina and their vessels showed proliferation of the interstitial and supporting tissue elements suggestive of syphilis.

J. JAMESON EVANS.

VIII.—STRABISMUS.

- 1 Bettremieux.—Some points in the treatment of strabismus. *Quelques points du traitement du strabisme*. *La Clinique Ophthalmologique*, 10 octobre, 1907, and *Bull. et Mém. de la Société Française d'Ophthalmologie*, T. XXIV, 1907, p. 413.
- 2 Valby.—Rémy's method of simple tenotomy. *L'Ophthalmologie Provinciale*, février, 1908.
- 3 Delord and Revel.—Métais' method for muscular advancement in strabismus. *L'Ophthalmologie Provinciale*, mars, 1908.
- (4) Poullain.—The use of coloured glasses for the cure of certain cases of intermittent strabismus. *Revue d'Ophthalmologie*, avril, 1908.
- 5 Bourdeaux, Bruno.—Functional and organic strabismus. *La Clinique Ophthalmologique*, 10 mai, 1908.
- 6 Landolt, E.—The clinical results of muscular advancement. *Archives d'Ophthalmologie*, mai, 1908.

1. After referring to the differences of opinion among ophthalmologists as to the age for operation, the degree of correction to be aimed at, and the question of simultaneous operation on both eyes, Bettremieux (Roubaix) expresses an opinion, in accordance with that of Priestley Smith and C. Worth, that if medical, optical, and gymnastic treatment, carried out for six months or a year, have given no result, then it is right to operate even in the case of a child of three and-a-half or four years of age. Further, the best method of operating is to attack the fixing and not the squinting eye, a procedure which minimises the risk of over correction. The author does not discuss the question of multiple operations: his remarks are confined to the wider question above mentioned.

ERNEST THOMSON.

(2) **Valby** states that since the invention of the diploscope in 1901 Remy, of Dijon, has not had to perform a single operation for strabismus. Previous to that date his method of tenotomising consisted in making a vertical incision through the conjunctiva, varying in length according to the effect desired, then dividing the tendon, without attacking any of its attachments to Tenon's capsule, and finally uniting the upper and lower extremities of the conjunctival wound by a suture so as to make it horizontal instead of vertical and thus to allow the cut end of the tendon to slip backwards from the cornea.

R. J. COULTER.

(3) **Delford** and **Revel** have obtained a good result in a case of convergent squint of 55° by a combination of the methods of advancement of Sauvigneau and Motais. The former ties the upper and lower sutures tightly around the corresponding halves of the tendon and the latter splits the muscle into halves which are attached one above and the other below the corneal margin by sutures passed twice in and out through the episcleral tissue at right angles to the direction in which the muscle acts, *i.e.*, vertically for the internal and external and horizontally for the superior and inferior recti. R. J. COULTER.

(4) In some cases in which the vision in each eye may be quite good and the patient have no difficulty in passing the usual tests for binocular vision with stereoscopic pictures, etc., the eyes will be found to diverge and the image of one eye to be suppressed if the patient looks at a distance or has his attention diverted from the test. **Poullain** has adopted the plan of putting such patients in glasses, the one eye being clear and the other coloured—the colour preferred being a No. 4 or 5 dark-blue. By wearing these glasses the attention of the patient is drawn to the divergence of the eye by the fact that objects previously blue have become clear, and this almost unconsciously brings the eye into the correction position to restore the colour. This device should also be useful for intermittent convergent strabismus, especially to prevent relapse after operation when binocular vision has not been firmly established.

J. JAMESON EVANS.

(5) **Bourdeaux** describes at length two cases of convergent strabismus, one functional cured by the use of the diploscope alone, and the other organic cured by the diploscope *plus* operation.

ERNEST THOMSON.

6. Tenotomy and its congeners, says **Landolt** Paris, enfeebles a muscle, whereas shortening, and especially advancement, strengthens its action. Tenotomy can have a favourable influence only from a static point of view; its effect is necessarily bad from a dynamic point of view. Its result, in fact, is comparable with a paresis of the muscle divided. It would almost appear as if strabismus were still attributed to a faulty insertion or to a contraction of a muscle, seeing the obstinacy with which surgeons continue to perform tenotomy. The favour still enjoyed by tenotomy is to some extent due to its simplicity of execution. The so-called "dosage" of tenotomy is illusory. In cases of insufficiency Landolt performs simple advancement on one eye; in slight strabismus, advancement on both eyes; and in pronounced squint, advancement, together with resection of more or less of the muscle. The muscle is always attached as close as possible to the cornea, and an immediate over-correction is invariably aimed at. Advancement may be performed on quite young children at an age when binocular vision may still be established. Tenotomy, on the contrary, under such circumstances exposes the child to the immediate risk of a very incomplete correction and to the remote risk of an over-correction. If tenotomy be delayed, it will be undertaken too late to establish binocular vision.

Landolt gives brief particulars of 22 patients upon whom he has operated by advancement during the last eighteen months. SIDNEY STEPHENSON.

IX.—OCULAR SYMPTOMS IN CEREBRO-SPINAL MENINGITIS.

Ballantyne, Arthur J.—Remarks on ocular symptoms in cerebro-spinal meningitis. *British Medical Journal*, 27th July, 1907.

Ballantyne Glasgow examined seventy-three cases of cerebro-spinal meningitis in patients whose ages ranged from 3 months to 47 years, and found ocular lesions in all except four. The ocular complications, which were of the most varied description, changed from day to day in one and the same patient, a point in which the author thinks they differ from those of other forms of meningitis. Ballantyne also lays some stress on the early occurrence of conjunctival hamorrhage, herpes of the lids, and on conjunctivitis, as symptoms likely to prove useful in the diagnosis of cerebro-spinal meningitis. Comparing cerebro-spinal with tuberculous meningitis, the infrequency of paralytic squint and of optic neuritis, and the relative frequency of spasmodic squints and dissociated movements are somewhat striking. It is probable, moreover, that defect or absence of vision without ophthalmoscopic changes is more common than in the tuberculous form. It is to be noted that no evidence of iritis, cyclitis, or choroiditis was found in any of Ballantyne's cases.

With regard to prognosis, Ballantyne expresses the opinion that retraction of the eyelids, corneal complications (ulceration or deficient corneal reflex), absence of the pupillary reflexes, nystagmus, lid winking combined with jerky movements of the eyes, and optic neuritis, are amongst the symptoms of grave significance. At the same time, the absence of ocular symptoms does not justify a favourable prognosis.

SYDNEY STEPHENSON.

X.—FAMILY SCLEROSIS OF THE CHOROIDAL VESSELS.

Guglianetti, Luigi.—On a special form of family sclerosis of the choroidal vessels. (*Su di una formadi sclerosi vascolare della corioide con carattere familiare.*) *Archivio di Ottalmologia*, Giugno, 1908.

A few months ago, while attending the Ophthalmic Clinique of Naples, under the direction of Professor Angelucci, the reviewer had the pleasure of observing the interesting clinical case reported by his friend **Guglianetti**, which presented extensive sclerosis of the choroidal vessels, occupying nearly the entire fundus of both eyes. As the author correctly states, such cases are of rather rare occurrence, and but few are to be found in the literature of ophthalmology. Similar cases are illustrated in Haab's *Atlas* and in that of Oeller; so also cases were described by Levinsohn, Beduarski, Knapp, and Cuperus, the latter calling the condition "Atrophia alba choroideæ."

The case observed was in a man, aged 52 years, and his sister, aged 31 years, was suffering from the same disease, and presented the same ophthalmoscopic appearances in both eyes as her brother. These two individuals were the offspring of the second marriage of their father, who married three times; but from enquiries made it was found that neither the children of his first wife, nor those of the third one, suffered from any diminution of sight, and one

must, therefore, conclude that they owed the disease to their mother's side. There was, however, no consanguinity between their father and mother. Furthermore, while his sister had never suffered from any disease and was quite healthy, the patient in question had, for the last fifteen years complained of disorders and alterations in the limbs, attributable to Raynaud's disease, and for the last six years, has had attacks of cold and warm feelings accompanied by urine of a dark-red colour, which are attributable to hæmoglobinuria, and from that time he has felt his sight getting weaker; finally, during the last three years, having lived in a marshy country, he has had attacks of ague, at times of the tertian form, at others of the quotidian.

The first ocular symptom which alarmed him was night blindness, *i.e.*, that towards evening his sight became so low that it was no longer possible for him to get along by himself: this symptom gradually became annoying also by day, the patient stating that everything seemed in a fog before his eyes, and going from light into a dark place, or *vice versa*, his eyes adapted themselves with difficulty to the sudden alterations of light, and after a long time he found he could just perceive large objects. From time to time he complained of photopsia, especially by night.

Present state.—The patient is of a good constitution. He presents loss of the extremity of the fingers and of the external ears due to Raynaud's disease, and also induration of the inguinal, laterocervical, and epitrochlear glands, but denies syphilis. The radial arteries are hard, the temporal very tortuous, the arterial tension is low, and the diastolic sound of the heart is accentuated; his urine contains traces of albumen. Nothing abnormal can be detected in the anterior part of the eyes and their appendages. Tension normal; refraction -3.0 D. in both eyes, and when corrected, he counts fingers at 1 metre with the right eye and at 3 metres with the left. On lowering the illumination, however, the patient loses all power of form sight, his perception of colours is greatly diminished, and of all colours he can distinguish red best. The field of vision, taken in strong light, has normal limits for white, red, and green; but it was not possible to ascertain that for blue, as the patient mixes up blue with dark-green. There is a relative central scotoma for white and red, and an absolute one for all other colours, more pronounced on the right side; on lowering the light, the perception of colours is completely lost. No annular scotoma. The above examination shows that the power of retinal adaptation, as well as the light-sense, is greatly altered.

Ophthalmoscopic examination.—The appearance of the fundus is almost equal in every respect on both sides. The optic disc is normal in shape and colour, margins sharply defined, and there is no posterior staphyloma. The disc is completely surrounded by a zone of a dark-brown colour (one disc-breadth all round), and outside this zone the choroidal vessels are very prominent, owing to loss of pigment of the epithelial layer of the retina. The choroidal vessels on the pigmented part of the fundus have the appearance of cords of a white lustre, in which the column of blood is not distinguishable. Their walls present no irregularities whatever; but when examined by the direct method, on the more opaque branches small, brilliant, scale-like bodies can be detected. These white vessels form, at the macular region, a close network with irregular meshes, which become wider as the vessels acquire a meridional course towards the equator, where they gradually lose their white lustre and present a pinkish lumen, finally acquiring the normal appearance at the periphery, where the fundus appears red. The retina, whose vessels have a perfectly normal appearance, presents patches of dark pigment, which are small and light around the macular region, become larger—half the size of the disc, but rarer at the equator where they are polyhedral or round in

shape, and further towards the periphery assume the shape of osseous corpuscles, similar to those seen in retinitis pigmentosa.

The patient, examined ten months later, presented no alteration whatever in the appearance of the fundi, the vision remaining the same as it was in the previous examination.

His sister, as has already been stated, presents the same ocular symptoms and the same ophthalmoscopic picture, without her having suffered from any one of the diseases enumerated in her brother's case. This fact tells for itself that the eye disease in question is not due to any one of the diseases suffered by the patient, and it must consequently be regarded as of family origin.

The author observes that these clinical cases confirm the experiments made by Wagenmann, Kruchmann, and Capauner, *viz.*, that by obstructing the choroidal circulation, atrophy of the retina is produced, which begins in the external layers with degeneration of the pigmented epithelium and is followed by the successive migration of the retinal pigment into the internal layers of this membrane.

The author, finally, in this article goes on to compare his clinical cases and those of Cuperus with retinitis pigmentosa, and especially with that form described in 1895 by Fuchs after having seen four of these cases at the Heidelberg Congress under the title of "Atrophia gyrata choroideae et retinae." He discusses fully the similitude and difference between the two diseases. Those who are interested in these choroidal changes should read the original article.

CHARLES MANCHE.

XI. RETINITIS.

- 1) van Geuns J. R. —A rare and curious affection of the retina. *Zeldzame en eigenaardige aandoening der retina.* *Ned. Tijdschrift voor Geneeskunde*, 1905, I, p. 179.
 - 2) Vignes.—The eye and Bright's disease. (El ojo y el Brightismo). *Archives de Ophthalmologie Hispano-Americaine*, Mayo, 1906.
 - 3) van der Hoeve, J.—Choroido-retinitis in man caused by naphthalin. Chorio-retinitis beim Menschen durch die Einwirkung von Naphthalin. *Arch. f. Augenheilkunde*, November, 1906.
 - 4) Guzmán, E. Two cases of a rare affection of the retina. (Zwei Fälle einer seltenen Netzhauterkrankung.) *Zeitschr. f. Augenheilkunde*, Januar 10, 1907.
 - 5) Jessop, Walter H. A clinical lecture on albuminuric retinitis. *British Medical Journal*, 30th March, 1907.
 - 6) Ballantyne, A. J.—Albuminuric retinitis with vascular changes: aneurysms on retinal arteries. *Glasgow Medical Journal*, February, 1908.
- Reuter, H.—A contribution on unilateral retinitis pigmentosa. *Beitrag zur Kenntniss der Einseitigen Retinitis Pigmentosa.* *Archiv f. Augenheilkunde*, Bd. LX, Heft 1, April, 1908, p. 59-62.

- (8) Knape, E. V.—On a very rare ophthalmoscopic appearance: von Hippel's disease simulated by glioma of the retina. (Ueber ein sehr seltenes ophtalmoskopisches Bild.) *Arch. f. Augenheilkunde*, Bd. LX, Heft 1, April, 1908, p. 49-57. Illust.
- (9) Morton, A. Stanford.—A peculiar form of retinal disease. *Transactions Ophthalmological Society U.K.*, Vol. XXVII, 1907-8.
- (10) Galezowski, J. and Valli.—Hereditary syphilitic central retinitis. (Rétinite syphilitique central hérédosyphilitique.) *Revue d'Ophthalmologie*, octobre, 1908.

(1) **van Geuns** observed a patient in whose retina numerous small white dots formed a ring around the macula and the papilla. In the lower part of the fundus other more greyish spots were visible. The vessels ran continuously over the white ring. The other eye was normal. In the course of a few years, the white area increased in size, the vision accordingly sank from $\frac{1}{2}$ to $\frac{1}{3}$. The white dots bear a certain resemblance to these in retinitis circinata, only in the latter they do not encircle the papilla but the macula only.

G. F. ROCHET.

(2) **Vignes** (Paris) calls attention to the important prognostic difference between the macular star of advanced renal disease and the small patches of exudation which may be seen (looking by the direct examination) on the branch of an arteriole. These may be found in the earliest stages, and life may be prolonged for many years after their discovery. Another symptom often noticed is the inability to maintain accommodation for a long time. This is very suggestive of the presence of albuminuria.

HAROLD GRIMSDALE.

(3) **van der Hoeve** observed choroido-retinitis in a man who for three years had been making large use of naphthalin as a preservative agent. The condition was limited to one eye. There was a central absolute scotoma with a concentrically contracted field. Vision was $\frac{5}{20}$. Besides choroido-retinitis, van der Hoeve saw something resembling a naphthalin crystal, and hence believes that the signs and symptoms were due to naphthalin poisoning.

PERCIVAL J. HAY.

4 **Guzmann** describes two cases of new formation of fibrous tissue in the retina, together with great enlargement of the blood-vessels with large aneurysmal dilatations. The fibrous tissue overgrowth is limited to certain parts of the retina, and at some places there are definite tumour formations. These cases were both in young men who stated that they could see well with the affected eye formerly, but that the sight had been gradually failing for some years. While under observation, in one case a hæmorrhage into the vitreous occurred, which gradually cleared up, leaving the fundus appearance the same as before, and in the other the vitreous became gradually filled with floating opacities. The ætiology is discussed, but no satisfactory conclusion arrived at.

A. LEVY.

(5) In this pithy lecture **Jessop** (London) summarises the well-known ophthalmoscopic appearances in the various forms of renal disease. Attention is drawn to the fact that retinitis exhibiting exactly the same signs is met with without any albumin being found in the urine, and sometimes without any apparent cause. Regarding prognosis, the writer says: "from my own experience I should say most of these patients die within one year of the diagnosis of albuminuric retinitis."

ERNEST THOMSON.

6 **Ballantyne** (Glasgow) gives a very full description of the fundus appearances at different dates in the history of a case of chronic nephritis

There are two fundus drawings executed in the author's excellent manner. Ballantyne reported the case because it showed practically all the evidences of arterial sclerosis found in the retina, namely, irregularities of calibre, silver wire appearance, constriction of retinal veins, conversion of small vessels into white streaks, aneurysmal dilatations, and also because he had been able to observe the disappearance of the aneurysms even while the high blood-pressure was maintained.

ERNEST THOMSON.

(7) After discussing the *pro* and *cons* of hereditary syphilis as a factor in the causation of retinitis pigmentosa, Reuter inclines to the view that hereditary syphilis may be regarded as a cause of the disease. He then describes a case of unilateral retinitis pigmentosa in a man, aged 65, who had "acquired" syphilis when about 35, and six years afterwards was subject to recurrent iritis in the left eye. Reuter found L.V. = no. p.l. Typical "bone-corpuscles" at the periphery and extending somewhat to the centre of the fundus, vessels very narrow, disc atrophic and yellowish. The author draws attention to the circumstance, that syphilis is acknowledged to be an occasional cause of bilateral retinitis pigmentosa, but that from the records it would appear to be more frequent in unilateral cases.

PERCIVAL J. HAY.

(8) Knape describes a case of glioma of the retina associated with extensive vascular degeneration. The patient, a boy, aged 10, came to hospital complaining that he had suddenly lost the sight of his left eye. On examination, the sudden blindness was found to be due to a detachment of the retina. In addition to this, however, the fundus showed intense arterial and venous congestion, some hæmorrhages, and numerous yellow nodules lying behind the retina. Tuberculin given for purposes of diagnosis produced no reaction. In the course of the next few months the vessels became very much more dilated and tortuous, the detached portion of the retina became of a bright yellow colour, and well-defined red swellings developed here and there. The case ended in secondary glaucoma. The eye was excised and examined microscopically. It showed a glioma of the retina, which had started from the external granular layer and had spread backwards into the optic nerve, and forwards as far as the equator. The small yellow nodules were metastases, and the red nodules were composed of loops of newly-formed capillaries.

PERCIVAL J. HAY.

(9) Morton (London) describes and figures the fundus in a man of 26 years who had noticed failure of vision only for one month; but as the eye had always been divergent, the actual duration of disease may have been longer. No family or general history of importance; other eye entirely normal. There were enormous masses of exudation in the fundus, mostly beneath the retinal vessels. The peripheral distribution of the vessels showed various peculiar forms of disease, such as narrowing of the lumen, white sheathing, aneurysmal dilatations, tortuosities, loops, kinks and glomerulus like new formations, hæmorrhages, pigmentation. Six weeks later, the eye was excised on account of pain and high tension. Pathologically, the white exudation was mostly due to swollen leucocytes in the subretinal space, the retina being thickened, degenerated, and widely detached. The beautifully coloured drawing will well repay attention.

ERNEST THOMSON.

(10) Galeczowski and Valli describe two cases of circumscribed retinitis due to hereditary syphilis.

CASE 1. A man, aged 25 years, whose father was tubercle and admittedly syphilitic. Ophthalmologically the left disc was seen to be woolly and extending from it along the retinal vessels were white processes of exudation. On the temporal border were bunches of very small greyish nodules. In the macular region was a large whitish soft oval mass and a half in diameter, the most prominent, its margins ill-defined. Three retinal vessels passed in front of it. Above all, on the nasal patches of choroidal retinitis extending towards the equator. L.V. = $\frac{1}{10}$. Central

scotoma corresponding to the macular exudate. The right eye only showed changes peculiar to an eye with high myopia, and whitish spots of choroidal atrophy with pigmented margins in the equatorial region. R.V. = $\frac{1}{6}$. Under specific treatment the macular exudation became reduced in extent and thickness, and those along the vessels completely disappeared after two months. L.V. = $\frac{1}{6}$.

CASE 2. — A boy, *et.* 14 years. Syphilitic antecedents not definitely established. Suffered from hydrarthrosis of left knee, and interstitial keratitis of the left eye. In the right eye he had a large rectangular white exudation occupying the macular region. It had the appearance of retinitis proliferans, but there were no newly-formed vessels, and the retinal vessels passed in front of the mass, and were unaltered. There was a large central scotoma continuous with the blind spot. Besides the interstitial keratitis, the left eye showed some posterior synechia, remains of papillary exudation, and small foci of choroiditic atrophy with pigmented edges near the periphery.

J. JAMESON EVANS.

XII.—THE PATHOLOGY OF CONJUNCTIVITIS DUE TO ATROPINE.

Villard, H.—The pathological histology of inflammation of the conjunctiva caused by atropine. (*Histologie pathologique de la conjonctivite atropinique.*) *Archives d'Ophthalmologie*, janvier, 1907.

Villard (Montpellier) removed a bit of conjunctiva 6 mm. by 2 mm. (or 3 mm.) from a patient in whom the prolonged use of atropine for sympathetic irido-cyclitis had caused conjunctivitis with an abundant formation of follicles, especially in the lower *cul-de-sac*. He now presents the results obtained by microscopic examination of the excised conjunctiva. Under a low power the preparations looked like those from a case of trachoma. Under a high power, however, almost all the cylindrical cells of the epithelium were found to have been converted into mucous cells. The deeper layer of cells, called by Villard the *cellules de remplacement*, preserved their normal characteristics. The calciform epithelial cells which covered the conjunctival follicles, on the other hand, were replaced by cells of various shapes—cubical, flattened, and so forth. The deeper layers retained their ordinary characters. Between the two layers of epithelial cells were clear spaces filled for the most part with polynuclear leucocytes. The superficial or adenoid layer of the sub-epithelial tissues contained so few leucocytes that it hardly merited the name of "adenoid." It seemed as if the cells normally present in this layer had migrated towards the points where follicles existed. *Mastzellen* were present in this as well as in the deeper or fibrous layer of the conjunctiva. The nodules or follicles, of which the specimens contained a considerable number, lay in the sub-epithelial tissues, and raised the epithelium which covered them. They were disposed irregularly and were seldom confluent. They were often more or less surrounded by leucocytes. They included well-developed blood capillaries, and but few polynuclear leucocytes. Villard conjectures that the extensive production of mucus by the transformed epithelial cells is a means of defence against further invasion by atropine. In fact, it determines, as it were, a relative isolation of the deeper parts of the conjunctiva. The author points out the analogies subsisting between the follicles of atropine conjunctivitis, on the one hand, and those of trachoma and follicular conjunctivitis, on the other.

SADLEY STEPHENSON.

XIII — THE BLIND SPOT OF MARIOTTE.

Ovio, G. — Observations on the blind spot of Mariotte. *Annali di Ottalmologia*, Vol. XXXVI (1907), pp. 3 to 115.

Ovio's remarkable monograph commences with a historical study of the question from the time of Mariotte (1860) to our own. This review focusses the question and prepares the ground for the critical study which the author has made on the methods of examination, on mensurations and calculations which allow of definition of the shape, size, and situation of the blind spot, its sensory function, and the phenomena manifested in the visual field. Then follows the author's personal experiments bearing especially on the blind spot considered with regard to irradiation and to accommodation, and in the perception of light, of colour, of form, and dimensions in so far as the region of Mariotte is concerned. Here are a few of the conclusions: in visual phenomena relating to the Mariotte spot irradiation exercises a great influence. Accommodation has no great influence on the size and situation of the blind spot: during accommodative effort the *punctum cecum* appears to become slightly lowered, which could be accounted for by the lowering of the lens, which has lately been observed as a constant phenomenon of accommodative tension. Round the blind spot there is an appreciable zone of relative blindness for white, and a somewhat more extended zone of relative blindness for colours. The perception of colours near the blind spot is similar to that in the periphery of the visual field. Near the blind spot the phenomena of fatigue easily become manifest, especially in experiments with coloured lights, and these phenomena of fatigue are the same as for the periphery of the retina.

A. ANTONELLI.

XIV — CATARACT EXTRACTION.

Elliot, R. H. — Some observations on cataract extraction. *Indian Medical Gazette*, June, 1908. Vol. XLIII, p. 210.

Elliot Madras now follows Herbert's plan of irrigating the conjunctival sac for 1-1½ minutes with 1 in 3,000 perchloride lotion before the cocain instillation. In addition, he swabs out the fornices carefully with sterile mops immediately before operation. "The results have been most gratifying." In a thousand consecutive extractions there has only been one panophthalmitis, and this disaster was attributable to incomplete extirpation of the lacrymal sac by another operator. The infective results at the Madras Hospital are given in tabular form for three periods—*a*. of 1,161 extractions during 1897, before Elliot's time; *b*. of 750 extractions during portions of 1901 and 1902, results already published in the *Lancet*, 1902; and *c*. of 725 extractions in 1907, under perchloride irrigation with swabbing. Although the period *b* showed a considerable improvement over the earlier results, there was still 0.4% panophthalmitis, 2% suppurative iritis or keratitis, and 2% non-suppurative iritis. In 1907, in addition to the one panophthalmitis already mentioned, 0.13%, there was 0.13% of suppurative iritis, and 0.13% of non-suppurative iritis. In support of the Madras practice of needling the capsule before making the section, Elliot mentions that the needle-puncture never leads, if the instrument be properly proportioned. Should leakage of aqueous

have occurred, however, either through the needle-puncture or owing to the point of the knife having been introduced with its cutting edge downwards, the anterior chamber may be refilled at once with physiological salt solution by pressing the nozzle of the irrigator against the puncture and turning on the stream, a small manoeuvre introduced by Captain Kirkpatrick, I.M.S. The needle-puncture, by the way, is placed so that it serves for the entry of the knife in making the section.

Elliot uses a "modified open" dressing in the form of a shield covered with absorbent wool. He has had good results from subconjunctival injections of normal saline solution in the treatment of iritis, and in hastening the absorption of cortical remains. Dionin has also aided in the latter process and in promoting the resorption of corneal opacities.

As a rare form of post-operative opacity is mentioned a round patch or ring in the deeper layers of the cornea, commonly associated with delayed healing of the wound. Rarely, there are two or even three small patches. Careful examination with a corneal *loupe* never fails to show some attachment of the lens capsule to the cornea at the densest part of the opacity. "If the capsule tag can be seen," writes Elliot, "it is seized with forceps and torn, when the section at once heals."

When a patient comes with immature cataract in both eyes, a simple preliminary iridectomy is performed upon the eye with the better sight, and Förster's ripening operation on the other. Elliot suggests that the preliminary iridectomy may be of service in preventing the onset of glaucoma, due to swelling of the lens during the cataract formation. These cases of glaucoma secondary to cataract often occur in batches in Madras, possibly suggesting some climatic influence. With regard to the cyanopsia observed in over 50 per cent. of the Madras cataract patients, the complaint certainly appears to be commoner in India than in Europe. Elliot has not been able to associate the blue vision with any particular type of cataract or of nuclear tint.

H. HERBERT.

XV.—HAY FEVER.

(1) **van Eeden, Ph.**—Hay fever. *Ned. Tijdschrift v. Geneeskunde*, 1905, II. No. 19.

(2) **Vigier.**—The eye and hay fever. (*L'œil et la fièvre des foin.*) *Recueil d'Ophthalmologie*, juin, 1907.

(1) **van Eeden** lets his patients with hay fever wear a kind of respirator. In each nasal aperture a ring of celluloid is placed, in which a layer of cotton is pressed between two small pieces of gauze. This instrument keeps back the pollen of the grasses, letting the air pass freely, and is no impediment to respiration.

G. F. ROCHAT.

(2) **Vigier** contends that hay fever may have an ocular origin. Reflex sneezing may be set up by irritation of the conjunctiva, or by excitation of the retina by sudden change from dull to strong light, and even by sudden change from strong to dull light. The reflex sneezing in these cases is so rapidly produced that the theory that it is due to the stimulation of the nasal mucous membrane by an increased flow of tears cannot be maintained. Other evidences, such as the fact that persons who suffer from hay fever, and who dare not go out in the day-time, can walk across fields in the dark and that the use of myotics gives relief in hay fever, lend support to Vigier's contention.

J. JAMESON EVANS.

XVI.—TRAUMATIC ENOPHTHALMOS ASSOCIATED WITH VOLUNTARY EXOPHTHALMOS.

Pasetti, G.—Traumatic enophthalmos associated with voluntary exophthalmos. *Annali di Ottalmologia*, Vol. XXXV, fasc 5-6, p. 354 to 365.

The syndrome in **Pasetti's** (Florence) case is a rare one, especially as regards the enophthalmos. After a good *résumé* of former observations on the subject, the author relates the case of a boy of 12 years who had enophthalmos of the right eye since about the age of two years, following a fall of no great violence (a little contused wound and ecchymosis of the right eyebrow). Since the age of 10 years the patient had also noticed exophthalmos following any effort or any quick lowering of the head and of the body. By the exophthalmometer of Weiss, the right eye, during rest, was 2.50 mm. deeper in its orbit than the fellow eye. The maximum exophthalmos was reached in 30 to 40 seconds by compression of the jugulars; no bruit, subjective or objective; dull sensation of pain around and at the bottom of the orbit. The maximum exophthalmos of the right eye was 5.50 mm. compared with the left eye; the right eye was also displaced 3 mm. down and 2 mm. towards the temple. Refraction and visual acuity normal, but copiopia, amounting to transitory blindness, was present during the voluntary exophthalmos. Except for a certain amount of engorgement of the veins on the disc, especially during exophthalmos, there were no ophthalmoscopic changes.

Pasetti explains the enophthalmos in his case by paralysis of, the smooth muscle fibres of the expansions of Tenon's capsule, and by atrophy of the retrobulbar cellular tissue, both of these being due to traumatic neuritis of the supraorbital nerve, propagated up to the ciliary ganglion and to its sympathetic root. As to the voluntary exophthalmos, it certainly was not due to a communication between the orbit and the nasal fossæ, nor to the presence of orbital varices; the vessels, especially the veins, of the orbit must have simply lost the normal resistance of their walls as a result of dystrophy by lesion of the sympathetic, and yielded overmuch to any blood stasis; all the more so because of the much weakened support rendered by the atrophied cellular tissue of the orbit.

A. ANTONELLI.

XVII.—ANGIO-NEUROTIC ŒDEMA.

Mazza, A.—Several cases of acute angio-neurotic œdema; Quincke's disease. *Annali di Ottalmologia*, Vol. XXXV, fasc 5, 6, p. 381-393.

The three very interesting observations related by **Mazza** show a localization of "the Quincke Duiklakker disease" in the eyelids and the conjunctiva, palpebral and bulbar. As in the classical forms of acute transitory angio-neurotic œdema of the authors named, the œdematous eyelids showed in **Mazza's** cases a normal or faintly erythematous skin tint; the œdema, did not retain the finger print, and was not accompanied by itching or pain; it came on rapidly, and disappeared in a day or two, relapsing at variable periods. In one of the three cases (a woman aged 45), it was possible to blame, as ætiological factors, chlorosis and the menopause; in

another, the feeble constitution and rapid growth of the patient (a lad of 15 years); in the third (a woman of 35 years) there were gastro-intestinal troubles, accompanied by slight albuminuria and neurasthenia.

A. ANTONELLI.

XVIII.—REMEDIES.

- (1) von Arlt, F. R.—Proof of the deep effect of dionin. (Nachweis der Tiefenwirkung des Dionins.) *Wochenschrift für Therapie und Hygiene des Auges*, 19 März, 1908.
- (2) Bylsma, R.—Has the serum treatment of diphtheria led to the diminution of the cases of paralysis of accommodation? Hat die Serum-Behandlung der Diphtherie eine Minderung der Fälle von Paralysis Accommodationis zur Folge? *Wochenschrift für Therapie und Hygiene des Auges*, 19 März, 1908.
- (3) Carlotti, P.—A case of rupture of the internal carotid in the cavernous sinus treated by injections of gelatinised serum. (Un cas de rupture de la carotide interne dans le sinus caverneux, traité par les injections de sérum gélatiné.) *Ann. d'Oculistique*, T. CXXXIX, p. 450, juin, 1908.
- (4) Baroggi.—Subconjunctival injections of corrosive sublimate in septic keratitis of traumatic origin. Le iniezioni sottocongiuntivali di sublimato nelle cheratiti settiche d'origine traumatica.) *Rivista Italiana di Ottalmologia*, August, 1908.
- (5) Haass.—On the treatment of iris tuberculosis by injections of air into the anterior chamber. (Ueber die Behandlung der Iristuberkulose mit Lufteinblasungen in die vordere Kammer.) *Wochenschrift für Therapie und Hygiene des Auges*, 5 und 12 September, 1908.
- (6) Discussion on serum-therapy in relation to diseases of the eye. (Report of the proceedings of the section of ophthalmology of the British Medical Association, Sheffield, 1908. *British Medical Journal*, September 12th, 1908.
- (7) Weitlaner, F.—Vesicants in ocular therapeutics. Vesicantien in der Augenheilkunde.) *Wochenschrift für Therapie und Hygiene des Auges*, 15 Oktober, 1908.
- (8) Adam.—A new method of treating gonorrhœal ophthalmia in adults by means of lenicet ointment. *Munch. med. Wochenschrift*, 1907, No. 43.

1. von Arlt reported two years ago THE OPHTHALMOSCOPE, Vol. V, 1907, p. 327 two cases of macular hæmorrhages in highly myopic eyes clearing up while under treatment with dionin and massage alone; but the result could not be proved to be due to the dionin. The present case was a man of 40 years with his right eye blind, vision with -10 D. $\frac{1}{50}$, and the history of the left his good eye) becoming dim 12 days earlier. Vision: left eye with -5 D. $\frac{1}{58}$, and a small central scotoma, in which the green colour-sense was diminished to one-half. In the macula a small oval hæmorrhage was found. Eight days later the vision remained the same, there having been

no treatment. 0.005 gramme of dionin (Merck) in powder form, was then applied. In 10 minutes the lymphatic œdema was at its height, and in 15 minutes the patient announced that the spot before the eye was smaller, and the vision became 5/6 to 5/6. By the following day it had risen to 5/5: to 5/4! The scotoma had disappeared and the hæmorrhage was not visible. The author employs an osmium lamp to illuminate his test-types, day-light being excluded. He, therefore, claims that while the hæmorrhage showed no change during 20 days without treatment, it immediately began to clear after the dionin application, and complete recovery occurred within 20 hours, the case having been under observation before, during, and after the single therapeutic application.

W. B. INGLIS POLLOCK.

(2) **Bylsma** has observed 46 cases of post-diphtheritic paralysis of accommodation during ten years (1898 to 1907) in children, in none of whom had the diagnosis of diphtheria been made earlier. There had, therefore, been no serum treatment, the cases having been undetected, or the throat affections having been so slight that medical advice was not sought. In all cases the pupils were unaffected, nor was there any other paralysis. On the other hand, the author has not had under observation, during the same period, a single case of paralysis following diphtheria treated by serum. To the possible objection that medical men now recognise these cases, and do not consult the specialist, he replies that his patients were sent by different doctors in a number of small towns; while he is aware, in addition, that there has been a single case only of post-diphtheritic paralysis during the last five years in the hospital to which diphtheria cases are sent, although he admits that the admissions have been low.

W. B. INGLIS POLLOCK.

(3) **Carlotti** records the case of a man, aged 35 years, who fell over the staircase from the second story of a house, striking the right side of his head against the pillar of the banister and rendering himself unconscious for 24 hours. There was some discharge from the patient's ear, and on recovering consciousness, he was found to have right facial paralysis of a peripheral type, while he subsequently developed non-pulsating exophthalmos of the right eye, with complete paralysis of the right third nerve, and a typical *bruit* heard subjectively and objectively. Treatment by the Lancereaux-Paulesco method (intra-muscular injections of 7 per mille serum, containing 25 grammes of gelatine in each 1,000 c.c.) was carried out in Morax's department at the Lariboisière Hospital, with the result that after each injection the symptoms disappeared for a time, while within a year the subjective noises had ceased completely, and the patient had improved so much that he was able to resume his work as a dyer. Four and a half months after the accident, the right frontal vein became enlarged, and on placing a finger on it a thrill could be felt, while on auscultation over it, a *bruit* was heard which was checked by compression against the orbit showing a reversed current from the superior ophthalmic vein towards the forehead. Subsequently a similar enlarged vein with a thrill developed horizontally in the upper lid. Eventually, both these veins ceased to be distended and lost their thrills. About eight months after the accident, during an interval in the treatment, the patient developed anaesthesia to pain and heat in the region of the cutaneous distribution of the right superior maxillary nerve. The author has not found this complication mentioned in any of the previously recorded cases, and considers that it was caused by the extension of the tumour backwards and outwards, so as to compress the nerve at its origin. A peculiar occurrence was, that 11 months after the accident, the patient had a sudden attack of giddiness, followed by loss of consciousness, on recovering from which he vomited a large quantity of blood clot.

R. J. COULTER.

(4) **Baroggi** finds the use of a 1 per cent. solution of perchloride of mercury as a subconjunctival injection almost a specific in the treatment of septic wounds of the cornea. In the few cases where the result has been unfavourable, treatment was delayed by the patient until the fatal process was too far advanced, and suppuration of the vitreous was present. He finds that the ensuing scar is less after this treatment than any other. He has noticed that sclero-corneal wounds are less amenable to treatment than those that are purely corneal, and the final results of the former are worse than those of the latter. Baroggi differs from Antonelli, in his opinion of the value of the galvano-cautery; this gives, he thinks, a much more extensive scar, and, therefore, lessens the chances of good vision afterwards should any operation become necessary.

The sole disadvantage, apart from the immediate pain of the subconjunctival injections, is that they cause the conjunctiva to become adherent to the globe, and thus limit its motility, and the number of injections possible.

H. GRIMSDALE.

(5) After a short sketch of the eight previously reported cases treated by this method, **Haass** relates the history of five of his own with the operation carried out in six eyes. It is well known that the diagnosis of tubercle of the iris is often by a process of exclusion, and accordingly one or two of these cases may have been doubtful, although they were all of the most obstinate character and accompanied by the formation of small yellowish-red or greyish-yellow nodules on the surface of the iris. A thorough course of mercury by inunction failed to produce any improvement in two of the patients, while a third gave a positive reaction with Koch's tuberculin. The remaining two cases were diagnosed, one from a tuberculous history, and the other from the local symptoms. In each instance a marked improvement followed the injection of sterilised air into the anterior chamber. The immediate result was an increase of the congestion, but by the third day the air had been completely re-absorbed, and the inflammatory appearances considerably reduced. Complete recovery may require several repetitions at intervals of a week or ten days, but it occurs in an "astonishingly brief time, which bears no relation to the severity and obstinacy of the disease." A Pravaz syringe is employed with a canula of the finest bore, the best polish, and as sharp as possible. A preliminary opening by a discission needle, and the withdrawal of the aqueous into the syringe before injecting the air was omitted in the latter cases. All antiseptic precautions are taken, and the canula is introduced through the conjunctiva as peripherally as possible (see THE OPHTHALMOSCOPE, Vol. II, page 522). A certain amount of aqueous is left. The explanation of the improvement is unsatisfactory.

W. B. INGLIS POLLOCK.

(6) This discussion was opened by **Axenfeld** (Freiburg), whose remarks appear in abstract only. He reviewed the various sera which have been employed in ophthalmology, and, for brevity's sake, one may express in a word or two only what appears to be Axenfeld's opinion of each, viz.:—*Behring's antitoxic diphtheritic serum*.—Well established, but the corneal infections accompanying may be due to pyogenic forms uninfluenced by this serum. *Anti-tetanic serum*.—Somewhat uncertain if tetanus has already set in. May be used in 10 to 20 c.cm. doses as a prophylactic in eye injuries with wood, if muddy, or whip-lashes. *Römer's jequiritol serum*.—Prevents necrosis caused by over-violent action of jequiritol in the treatment of pannus. *Römer and Merck's anti-pneumococcal serum*.—Does not act so certainly that it can take the place of surgical treatment of *ulcus serpens*, except in benign cases. May be employed when other treatment fails. *Streptococcal serum* or

vaccine.—May be used in streptococcal diphtheria of the conjunctiva. *Staphylococcal serum*.—Very little known at present about it. As regards *gonorrhoeal conjunctivitis*, it would not be difficult to obtain a serum in one or two days, but most authors are agreed that an undoubted influence on the disease is not obtained in urethral gonorrhoea. With a greater prospect of success the metastatic gonorrhoeal eye affections might perhaps be treated in this way. *von Hippel's tuberculin treatment* has cured a large number of cases of tuberculosis of the eyeball. Extremely chronic cases of tuberculous irido-choroiditis are hardly influenced, in Axenfeld's own experience, by the tuberculin treatment. *Sympathetic ophthalmitis*.—*zur Nedden's* method of injecting blood-serum from patients with sympathetic ophthalmitis into others similarly affected has been negative in Axenfeld's hands. *Morax-Axenfeld bacillus*.—Serum not worth while, owing to curative action of zinc salts. *Polyvalent serum*.—Axenfeld, after going carefully into the claims of Darier and Deutschmann that as good results are to be obtained by the use of non-specific sera, such as that prepared from diphtheria, tetanus, and yeast against *all* kinds of infection, does not think that non-specific sera hold out anything like such a good prospect of success in definite diseases as the specific sera. He criticises Darier's failure to confirm his work by experiments on animals, and Deutschmann's method of producing infection. Deutschmann's experiments are unconvincing, but Axenfeld is having test experiments made to confirm or otherwise the former's observations. Following the traditions of Pasteur, Koch, and others, a very high standard had been maintained in serum research in demanding accurate experimental work, and he raised a note of warning lest this standard should be lowered. In ophthalmology they must insist on experimental work conducted upon the eye itself.

Percival J. Hay (Sheffield) agreed with Professor Axenfeld as to polyvalent sera.

Hern (Darlington) was unable to say that any definitely good effect had been produced by multivalent serum, which he had used in a good many cases.

Bishop Harman (London) was forced to conclude that serum therapy, so far as the eye was concerned, had not established itself. In neither of the two classes of case in which it would be most useful, namely, streptococcal invasion of the conjunctiva and chronic iridocyclitis, particularly tuberculous, had he found it of any avail. In the former class of case the disease was too rapid to allow of a serum being obtained in time; in the latter class the tuberculin treatment was much inferior to that by good food and residence in a healthy, bracing, seaside sanatorium.

Fuchs (Vienna) had not carried out any experiments. His experience was confined to some clinical observations of different sera, and although some cases seemed to benefit from it, the success was never so striking as to put beyond doubt the curative influence of the serum. He agreed with Axenfeld that experimental evidence should be accepted before anything else to decide the question of the efficacy of serum treatment.

L. C. Peel Ritchie (Edinburgh) said that it can hardly be the case that serum therapy is more rapid in action than inoculations of bacterial suspensions. The method of preparing a bacterial suspension to ensure its activity is much more important than the question of whether it has been obtained from the patient's own organism. A properly prepared suspension should be equivalent for all infections due to the same organism.

Axenfeld, in replying, said that the opsonic index as a test of immunization was still under discussion. The opsonic power was only one of the phenomena

of immunity and perhaps not even the most important one. As regards tuberculin treatment, very extensive researches, continued for a long time in the same patient, were necessary, so as to compare the index with the course of the eye disease.

ERNEST THOMSON.

(7) Predicating that Liebreich and Virchow recommended cantharides in the treatment of tuberculosis, **Weitlaner**, after a short discussion of the relation of keratitis phlyctenulosa to tubercle or scrofula, pleads for the revival of vesicants in the treatment of this affection. As he points out, the resulting corneal cicatrices, especially if perforation occurs, may lead to more or less blindness, and so be of importance in the science of economics. He recommends blistering where there is severe conjunctivitis, blepharospasm and iritis, cases in which his two specifics, *viz.*, the yellow oxide of mercury ointment and calomel are, as a rule, badly borne; at the same time they may be required to complete the cure. The emplastrum cantharidis on a piece of lint, the size of a florin, should be applied immediately anterior to the ear and under the margin of the hair. This may be left in place or exchanged the following day for a dressing of zinc ointment. If necessary, a blister may be applied on each side. A milder effect may be obtained by mixing the plaster with equal parts of diachylon ointment. The author has followed this method of treatment for a number of years, but it is useless in other forms: conjunctivitis, keratitis, or iritis.

W. B. INGLIS POLLOCK.

(8) **Adam** recommends that ointment used in the treatment of gonorrhoeal ophthalmia should be made, not with vaseline, as is customary, but with euvaseline—that is to say, a mixture of white American vaseline and lanoline and cerosine. This ointment does not become fluid at the temperature of the body, and has, besides, the advantage of restraining and rendering inoffensive the discharge from the eye if lenicet or acetate of aluminium be incorporated with it. The lenicet and euvaseline ointment (10 per cent.) is applied every two hours, even during the night, to the inflamed conjunctiva. When the secretion has lessened, which happens, according to the author, in from one to three days, a 5 per cent. ointment is used every three or four hours. At this stage cauterisations are carried out daily by means of 0.5 per cent. solution of silver nitrate, but if the discharge becomes more marked, the stronger lenicet ointment is again used. When secretion has disappeared, the case is treated with oxide of zinc ointment, 0.5 per cent., made with vaseline.

MAX. P.

BOOK NOTICES.

The Royal London Ophthalmic Hospital Reports. Edited by WILLIAM LANG, F.R.C.S. Volume XVII, Part III. November, 1908. London: J. and A. Churchill, 7, Great Marlborough Street. Price 5s. net.

The present number of the *Ophthalmic Hospital Reports*, although it consists of nearly 260 pages of printed matter, includes three communications only: 1. Nettleship.—On retinitis pigmentosa and allied diseases; (2) Hancock.—Certain points in regard to the fields and fundus changes in obstruction of the central artery of the retina; and 3) Coats.—Forms of retinal disease with massive exudation.

Bulletins et Mémoires de la Société Française d'Ophtalmologie.
Vingt-cinquième année, 1908. Paris: G. Steinheil, 2, Rue Casimir-Delavigne.

This substantial volume contains an account of the proceedings at the last meeting of the French Ophthalmological Society held in Paris in May, 1908. On that occasion the Society celebrated its twenty-fifth anniversary, an account of which is included in the present volume. Many pages are occupied by Terson's communication on the treatment of wounds of the eye, which was noticed in these columns in June last. There are, of course, many other communications, some of which have already been abstracted in *THE OPHTHALMOSCOPE*. Others will appear in due course.

Pupillenlehre, Anatomie, Physiologie, und Pathologie Methodik der Untersuchung (The Pupil). By LUDWIG BACH. Berlin: S. Karger, 1908. Price 12s.

With recent improvements in the *technique* of pupillometry, and especially with the application of photographic and binocular methods of observation, greater exactitude has been introduced into the study of this important subject. Mention might be made of the researches of A. Fuchs, and of the large monograph of Albrand and Schröder on the behaviour of the pupil at death. In the present book, Bach takes a more general view of the present state of our knowledge, supplemented by an account of his own researches in certain fields.

The work begins, naturally, with an account of the anatomy of the pupillary paths and centres, and of the physiology of the iris movements. In spite of an enormous amount of labour, the portion of the reflex arc between the afferent fibres of the optic tract and the efferent fibres of the oculo-motor nerve, seems to be enveloped in darkness. Bach believes that the Edinger-Westphal nucleus forms no part of the circle. He points out that it is necessary to suppose a motor as well as a visual crossing, otherwise illumination of one eye should cause contraction of the other pupil only. The functions of the ciliary ganglion receive full treatment.

In the physiological section, an interesting account is given of the variations in the size of the pupil in different states of refraction and at different ages. Bach adheres to the commonly-accepted view that contraction is associated with convergence rather than with accommodation. As to dilatation, he draws a distinction between "active dilatation," due to stimulation of the sympathetic, and "passive dilatation," due to sensory and psychic impulses. The former is characterised by a shorter latent period, and by a quicker attainment, and shorter retention of the maximum. The author believes that sensory and psychic stimuli act by inhibition of the oculo-motor nucleus.

Passing to pathological conditions, a useful summary is given of the causes of inequality. Among them is mentioned, with due reserve, anisometropia. Much space is devoted to the differentiation of "absolute" immobility, in which the pupil does not respond to convergence, light, or sensory impulses, and "reflex" immobility, in which it reacts to convergence but not to light (Argyll Robertson pupil). The latter and spinal miosis are discussed with the fulness which their importance merits. Bach has a theory of his own on the subject, for the details of which the original should be consulted. It is sufficient to note here that it involves two inhibition centres at the spinal end of the medulla, one concerned with the regulation of light reflexes, and one with the regulation of sensory and psychic reflexes. He believes that the presence of such centres has been proved by his experiments on the cat, but his views

have by no means received general credence or confirmation. It would seem that "inhibition centres" are rather dangerous servants to the physiologist: it is too easy to place one at the desired spot and to explain obscure occurrences by its means. One recalls the words of the old and very wise teacher who solemnly warned his students never to have anything to do with theories which invoked the vaso-motor nervous system, or the functions of the sympathetic. Whatever hypothesis be adopted, however, the analysis given by Bach cannot fail to be of value; his account emphasizes forcibly the enormous difficulty of the subject.

A considerable section of the book is devoted to the condition of the pupil in individual diseases. Naturally, affections of the nervous system occupy a position of chief importance. A general account is given of the localising value of pupil symptoms, a subject which is only imperfectly worked out, at least for the basal nuclei. Useful chapters deal with syphilis, mental affections, and the various intoxications. The monograph closes with a description of methods of observation, together with a list of nearly 1,800 references.

From the nature of its subject-matter, it will be understood that the book can scarcely be recommended as light reading. But as a work of reference it should be found most useful. There seems to be no other recent work which treats of the subject from quite the same point of view, and both neurologists and ophthalmologists will appreciate its value.

GEORGE COATS.

Therapeutische Taschenbuch für die Augenpraxis. (A Pocket Book of Therapeutics for use in Ophthalmic Practice.) Von Dr. CUST ADAM, Assistenzarzt an der Königl. I. Universitäts Augenklinik in Berlin. 1908. Preis, 5 M.

In this book of 250 pages that part of ophthalmic work which falls to the lot of the general practitioner, for whom it is mainly written, is epitomised. The author presumes a certain amount of knowledge of this kind of work on the part of his readers, and consequently treats of many conditions in few words, but sufficiently to enable them to turn what knowledge they have to good account.

A short introduction is devoted to a description of the various methods of examination, after which the book is divided into a general part treating of (1) medicaments and their various applications, and (2) general treatment by modern methods. A special part giving the differential diagnosis and treatment of most pathological conditions of the eye and a third useful part are devoted to a description of first-aid to those suffering from injured eyes.

At the end of the description of each disease a formula is given, and in many cases where proprietary remedies are used the maker's name is added, and the price at which the drug may be obtained—sometimes useful information.

Among the drugs recommended in the work, the following may be mentioned as showing its claim to be modern: acolin, alypin, antisclerosin, tulase, antitulse, lenicet, bleno-lenicet, euproctinol, ephedrin, euphthalmin, thergal, iethargan, iodylidine, itrol, validol, sirolin, and many others. These preparations are embodied in various formula numbering 150, to be found at the end of the book.

Reference is made to Deutschmann's serum and Römer's serum in the treatment of *ulcus serpens*, about which so much has been written lately. Römer's serum appears to be the more favoured one, but the question is at present in the "melting pot," as the necessary experience is wanting to place either of these preparations on a sound therapeutic footing.

Mention is also made of Römer's treatment of commencing cataract, which consists in the administration of tablets (at present not on the market) prepared from the preserved lenses of animals. A short account of the estimation of errors of refraction is given, based on the old subjective method, which, in this country, is practically out of date, no mention of it being made in some modern text-books. Retinoscopy is referred to, but the reader is advised to consult a larger treatise. With this exception, the book is fully up-to-date, and any general practitioner who reads German will find its possession a very useful addition to his library. It is well indexed, there being no less than 1,100 references in the register. GEORGE H. OLIVER.

La Cécité et les Aveugles en Algérie. (Blindness and the Blind in Algeria.) Rapport sur la résultat de l'enquête effectuée par le Dr. EDMOND BRUCH, Directeur Honoraire de l'Ecole de Médecine d'Alger. Paris: G. Steinheil, 2, Rue Casimir-Delavigne, 1908.

Dr. Bruch's enquiries—the utility and importance of which were suggested to him by the French Government—have extended over two years. He points out that, for various reasons which can be readily understood, such investigations can never be rigorously exact. The number of the blind in Algeria is very great, being at least three times larger than in France, and it is important to obtain some idea of their proportion to the population, for not only is the blind man, as Trousseau has said, valueless, but he is also a source of considerable expense to the State.

Algeria is divided into three departments, *viz.*, the department of Algiers to the north, the department of Oran to the north-west, and the department of Constantine to the north-east. The departments are divided up into communes—Algiers into 127, Oran into 100, and Constantine into 107. The population of the 334 communes amounts to 4,034,534 persons. From 56 communes, having a population of 211,143 persons, replies were received to the effect that there were no blind in those districts, and it is to be noticed that the towns here situated included those that were the most prosperous, cleanly, and intelligent, or, in a word, the most advanced in civilisation. Each department appears to be divisible into three sets of communes, named respectively *communes de plein exercice* (which we must frankly acknowledge ourselves unable to translate literally, unless it signifies chiefly or wholly military); mixed communes; and civil territory.

In the Department of Algiers there were—

In the communes de plein exercice	10,602 blind per 10,000 inhabitants.
In the mixed communes	23.5 " "
In the civil territory	21.30 " "

In the Department of Oran there were—

In the communes de plein exercice	21.15 " "
In the mixed communes	33.64 " "
In the civil territory	27.76 " "

In the Department of Constantine there were—

In the communes de plein exercice	13.34 " "
In the mixed communes	26.69 " "
In the civil territory	23.49 " "

In addition, the numbers in certain indigenous communes are given, including Barika, Biskra, Bouchela, Tcheoua, and Tonggout, and show a far higher proportion, *viz.*: 2,130 blind in 222,703 inhabitants or 1007 blind in 10,000 inhabitants.

In the civil territory of Oran there were 28 blind per 10,000, and in the civil territory of Constantine 23 per 10,000. In the military command of

Algiers the proportion of blind rose to a very high proportion, in the subdivision of Medea to 45·5 in 10,000, and in the *cercle* of Bou Saada and the annex of Sidi Aissa to 137·3 in 10,000.

The conclusions arrived at in the report are to this effect.—Those affected with blindness in one or both eyes are very numerous in Algeria. In the civil territory there are 5,333 blind with one eye, and 9,889 blind with both eyes, or 25 blind in 10,000 inhabitants. In the military territory in the district of Bou Saada, the exact number was 137 in 10,000; and less, but not exactly known, in other districts. It may be accepted, then, that there are 25 blind per 10,000 in the civil territory, and 100 per 10,000 in the military territory. In France, as a whole, the proportion is 8 per 10,000, but there are parts where the ratio is much higher—as, for example, in Corsica, where it rises to 23 in 10,000. In Algeria the great majority of cases of blindness occur among the indigenous population, but it must be remembered that these constitute the mass of the population. The number of Europeans is 578,048, of which 358,129 are French, whilst of Mussulmen, Arabs, Kabyles, Moroccans, and Tunisians there are 4,091,131. The registered blind amongst the Europeans were 581, or a trifle less than 10 : 10,000. Of these 581, 257 were French, 274 Spaniards, 25 Italians, 19 Anglo-Maltese, 4 German, 1 Swiss, and 1 Pole.

In regard to sex, amongst the total number of 25,000 blind of one or both eyes, the proportion of women in both the civil and military territory was the same—one woman in every six cases.

In regard to age, about one-third of the blind were over 60 years, of whom many showed traces of small-pox, of which the blindness was the result. The provisions for vaccination, and still more for re-vaccination, it is fully expected, will materially reduce this proportion.

The occupations most frequently followed were agriculturists, fellahs, landlords, day-labourers, housekeepers, and mendicants (*sic*). One-tenth of all the cases registered were thought to be, under treatment, curable, and they are willing and even desirous to undergo the operation for cataract. If caught early, they might be taught many trades.

In considering the probable causes of the blindness, trachoma stands in the first place, and is responsible for one-fourth of all the cases, purulent ophthalmia for one-eighth, and cataract also for one-eighth. To these affections, with small-pox, most of the cases having a medical aspect were attributable; precisely those cases of which the numbers, it may be hoped, will be reduced by improvement in hygiene and a greater willingness on the part of the natives to submit to treatment.

To this end Dr. Bruch suggests that every hamlet should have its own fountain or water supply; that centres for public vaccination should be instituted; that lectures should be given, and flyleaves with simple hygienic instructions should be distributed; and, lastly, that centres for the instruction of the blind and for the sale of their work should be formed.

The immense majority of binocular blindness occurred amongst Arabs or Kabyles; there were but few Europeans. As might be expected, the fewest blind occurred amongst the affluent, and the greatest number in the poor or in those in moderate circumstances.

In regard to the proportion of monocular to binocular blind, it appeared that those blind of one eye in the civil territory of Algeria was 5,333 to 8,989 blind of both eyes.

Speaking generally, in the civil territory there were 25 blind to 100,000 inhabitants, and in the military territory 100 to 100,000. In France the number of blind is 8 to 100,000, so that the proportion of the blind in Algeria is about three times as great as in France.

HENRY POWER.

La Ponction Lombarre dans les Affections Oculaires (Lumbar Puncture in Affections of the Eye). By Dr. PAUL de RIDDER. Bruxelles: imprimerie médicale et scientifique L. Severcyns, 44, Montagne-aux-Herbes-Potageres. 1908.

This Report of 120 pages, dealing with lumbar puncture in affections of the eye, was presented by Dr. Paul de Ridder, on November 20th, 1908, to the Belgian Ophthalmological Society. It will repay perusal by a larger circle of readers.

A preliminary chapter is devoted to the cerebro-spinal fluid, its origin, its anatomical situation, its functions, its composition, and so forth. Particular attention is given to its cytology and bacteriology. As regards lumbar puncture, the operation is free from danger, except in cases of tumour (especially cerebellar tumour) or abscess or in uræmic subjects. The puncture should be made in the fourth lumbar interspace (Quincke and Sicard) or between the last lumbar vertebra and the base of the sacrum (Chipault). The operation should be performed under strict antisepsis, and not more than 10 c.cm. to 20 c.cm. of the fluid should be evacuated, and even a less quantity in children and in cases of cerebellar tumour. Any attempt at aspiration while the syringe is in place should be sedulously avoided. The patient should remain in bed for twenty-four hours, with the pelvis somewhat raised. Specimens of the cerebro-spinal fluid, centrifugalized or not, are spread upon cover-glasses, and stained with agents such as methylene blue, cosine, and Ehrlich's triacid. Some stress is laid by de Ridder upon an interruption between the spinal and cranial cavity, such as might be brought about by pathological adhesions, as a source of fallacy in interpreting the results of a cytological examination of the cerebro-spinal fluid.

de Ridder divides diseases of the eye into: (1) those produced by factors devoid of influence upon the cerebro-spinal fluid, and (2) those determined by causes which affect both the eye and the cerebro-spinal fluid.

In doubtful cases of syphilitic eye affections lymphocytosis of the cerebro-spinal fluid may confirm the diagnosis, although obviously the absence of lymphocytosis does not allow us to exclude syphilis in a given case. Polynucleosis may be sometimes found in acute specific diseases, as meningitis or meningo-myelitis. Lymphocytosis speedily disappears under treatment by mercury and iodides, as shown by cases published by Belette, de Lapersonne, and other writers. Lumbar puncture, by relieving excessive tension, may alleviate syphilitic headaches of meningeal origin, and the little operation is stated to accelerate cure in syphilitic neuritis, by abstracting a portion of the toxin-laden fluid which is largely responsible for the affection of the nerve.

In affections of the optic nerve it is, of course, the causes of the neuritis and not the optic neuritis itself that determine alterations in the composition of the cerebro-spinal fluid. In such cases lumbar puncture is useful from the diagnostic, the ætiological, and the therapeutical point of view. In cases of intra-cranial tumour, abscess, and cyst, examination of the fluid is negative as regards lymphocytosis. Its tension, in the author's experience, is not raised, its toxicity is not enhanced, and its tonicity is normal. The fact must not be lost sight of, however, that certain intra-cranial neoplasms accompanied by meningeal complications or caused by syphilis may give rise to changes in the composition of the fluid. When lumbar puncture is performed in cases of cerebral tumour it diminishes, as a rule, such symptoms as headache and vomiting. Its action in cases of optic papillitis has been praised by some authors and decried by others. de Ridder considers that the operation is

curative in cases of optic neuritis due to intra-cranial exudation, post-traumatic or inflammatory, while in tumour or abscess it is merely palliative. In meningitic optic neuritis the cerebro-spinal fluid shows an increased amount of albumin, polynucleosis, lymphocytosis, and perhaps any of the micro-organisms capable of determining an inflammation of the meninges.

In optic atrophy lumbar puncture exerts no particular curative action, but an examination of the evacuated fluid may be helpful as regards diagnosis. It has been suggested by Babinski and Nageotte that the existence of a lymphocytosis would differentiate the tabetic from the non-tabetic form of atrophy. But that appearance may be due to syphilitic factors other than tabes, as meningo-myelitis, cerebral syphilis, general paralysis, and even sclerosis and meningitis. It may be pointed out that the characters of the cerebro-spinal fluid are negative in cases of Friedreich's ataxy.

de Ridder gives the following conclusions:— (1) Affections of the eye, even those of the optic nerve, do not change the composition of the cephalo-rachidian fluid. (2) Alterations in the cerebro-spinal fluid and in various parts of the eye may be determined by the same pathological process. (3) In certain affections of the eye lumbar puncture furnishes very valuable data for the aetiological diagnosis, and sometimes very early ones. At the same time a single feature of the cerebro-spinal fluid does not usually afford much information from the diagnostic standpoint. We must take the characters of the fluid as a whole and compare them with the clinical signs. Lumbar puncture sometimes yields prognostic elements. (4) In some cases lumbar puncture becomes a very valuable therapeutic agent. Headache is the only frequent accident. The operation presents danger only in cases of tumour, especially in abscess and tumour of the cerebellum, and in individuals affected with uræmia. Employed with circumspection, lumbar puncture is practically harmless.

SYDNEY STEPHENSON.

CORRESPONDENCE.

To the Editor of THE OPHTHALMOSCOPE.

Sir,

In your November number, in Mr. MacCallan's interesting article on "Ophthalmic Conditions in the Government Schools in Egypt and their amelioration," the following statement is made regarding the radical treatment of trachoma: "The operation is known as Kuhnt's combined excision of tarsus and conjunctiva. It is a comparatively new operation, a description of which has not yet found its way into the text-books." May I be allowed to mention that the operation is described in my "*Manual of Ophthalmic Operations*," published in February, 1908. It is illustrated with three illustrations which Professor Kuhnt allowed me to reproduce from his monograph "*Ueber die Therapie der Conjunctivitis granulosa*," published in 1897, and the indications for its aims by Heistrath many years ago are also reproduced. I saw excellent results follow its performance by Professor Kuhnt in Bonn last May, and previously I had occasionally done it here with satisfactory results.

As regards Colonel Herbert's letter in your November issue, I would observe that the quotation from Axenfeld does not prove his case. Even if eventually found to be correct, it merely affirms that infection cannot reach the conjunctiva from the nose through a *healthy* nasal duct.

I am, etc.,

F. P. MAYNARD.

13, Harington Street, Calcutta.
November 24th, 1908.

NOTES AND ECHOES.

Deaths.

ON December 5th, the death occurred unexpectedly in London, of Charles Edward Beevor, physician to the National Hospital for the Paralyzed and Epileptic, and one of the original members of the Ophthalmological Society of the United Kingdom. Dr. Beevor had acted as secretary of the Ophthalmological Society from 1891 to 1894, and as vice-president from 1902 to 1904. During the course of a distinguished career Dr. Beevor was Croonian Lecturer of the Royal College of Physicians in 1903, and Lettsomian Lecturer of the Medical Society of London in 1907. He was president of the Neurological Society in 1907. He was 54 years of age at the time of his death. R.I.P. Robert Allen, Assistant Surgeon to the Ulster Eye, Ear, and Throat Hospital, Belfast, died on December 2nd, at the early age of 39 years.

We regret to announce the death of Albert Kopff, formerly Galezowski's *chef de clinique*. He was an original member of the Paris Ophthalmological Society, of which body he had occupied the presidential chair. Kopff was oculist to the St. Joseph Hospital, Paris.

Professor J. Schnabel, of Vienna, died suddenly on December 4th, from apoplexy, in the 66th year of his life. Dr. Wenzel Matys died on November 18th, at the age of 40 years. By a singular coincidence (by no means free from pathos), two days after his demise, Matys's appointment as extraordinary professor of ophthalmology in the Czech University of Prague was promulgated in the official press.

Emil G. Rehfuss, Consulting Ophthalmologist to St. Agnes' Hospital, Philadelphia, U.S.A., died the 21st of October, 1908, aged 47 years. Frederick H. Wells, of Syracuse, New York, U.S.A., died the 5th of November, 1908, aged 47 years. Nelson M. Covert, of Geneva, New York, U.S.A., died the 7th November, 1908, aged 68 years.

* + * *

Appointments.

WHISHAW WILLIAM GROSVENOR has been appointed physician to the Gloucester General Infirmary and Eye Institution. George Poole David Hawkes has been appointed honorary assistant surgeon to the West of England Eye Infirmary, Exeter. William Ettles has received the appointment of pathologist to the

Royal Eye Hospital, Southwark, London. August Probsting has been appointed professor of ophthalmology in the Academy of Practical Medicine at Cologne, Germany. The title of professor has been accorded to Dr. Georg Abelsdorff, *privat-dozent* of ophthalmology in Berlin. Dr. William F. Ridgway has been appointed attending ophthalmologist to the Atlantic City Hospital, Atlantic City, New Jersey, U.S.A. Dr. Brown Pusey has been appointed head of the department of ophthalmology in the North-Western University Medical School in Chicago, Illinois, U.S.A. Dr. Frederick M. Spalding, of Boston, has been made a member of the Committee on Ophthalmia Neonatorum of the Massachusetts Medical Society, which will hold its annual meeting in June, 1909. The following gentlemen have been appointed examiners in ophthalmic surgery for the Fellowship of the Royal College of Surgeons of Edinburgh: George A. Berry, George Mackay, jun., William George Sym, and James Veitch Paterson. Drs. Christian R. Holmes and Stephen C. Ayres have been elected Consulting Ophthalmologists, and Drs. Robert Sattler and Derrick T. Vail Visiting Ophthalmologists, to the Cincinnati Hospital, Cincinnati, Ohio, U.S.A. Dr. Alexander W. Stirling of Atlanta, Georgia, U.S.A., and Dr. Arthur E. Harris, of Birmingham, Alabama, U.S.A., have been elected chairman and secretary respectively, of the Section on Ophthalmology of the Southern Medical Association for the 1909 meeting, to be held at New Orleans.

+ + + *

Dr. G. Fritsch.

THE Prussian Academy of Sciences has granted to Dr. Gustav Fritsch £100 to enable him to publish a work on the area centralis of the human retina.—*Lancet*.

* * * *

British Medical Association.

THE seventy-seventh annual meeting of the British Medical Association will be held at Belfast, Ireland, from July 23rd to July 31st, 1909, under the presidency of Mr. Simeon Snell, ophthalmic surgeon to the Royal Infirmary at Sheffield. The scientific business will be conducted in fifteen sections, which will meet on July 28th, 29th, and 30th. The following are the officers of the Section of Ophthalmology:—President: John Walton Browne, M.D., 10, College Square, Belfast. Vice-Presidents: Arthur W. Sandford, M.D., 13, St. Patrick's Place, Cork; William Marcus Killen, M.D., 9, Clifton Street, Belfast; Alex. Hill Griffith, M.D., 17, St. John Street, Manchester. Honorary Secretaries: James Andrew Craig, M.B., 11, University Square, Belfast; Leslie Johnston Paton, F.R.C.S., 1 Spanish Place, Manchester Square, London, W.

* * * *

Norfolk and Norwich
Eye Infirmary.

A SPECIAL meeting of the Governors of the Norfolk and Norwich Hospital was held recently, under the Presidency of the Lord Lieutenant of Norfolk, to consider the question of the proposed amalgamation of the Norfolk and Norwich Eye Infirmary. A resolution approving of the scheme was adopted by the meeting.

French
Ophthalmological
Society.

KERATOCONUS has been the subject chosen for discussion at the next meeting of the French Ophthalmological Society, which will take place on the first Monday in May, 1909. The discussion will be opened by Professor Parisotti, of Rome.

New York Optometry
Law.

THE following *provis* of the New York Optometry Law, which comes into operation with January this year, may interest readers of THE OPHTHALMOSCOPE.

The practice of optometry is defined as the employment of any means, other than the use of drugs, for the measurement of sight and the adaptation of glasses. The Board of Examiners in Optometry, which will be appointed by the State Board of Regents, will consist of five persons, who shall have resided in the State of New York and been engaged in the practice of optometry for at least five years. Candidates, who must have studied for at least three years in a registered optometrist's office, or have graduated from a school of optometry, may present themselves for examination, and if successful shall be registered as possessing the necessary qualifications. Men who have already been engaged in the practice of optometry for two years may claim exemption from examination and be placed upon the register. The registration is filed, together with a photograph of the individual. The fee for examination is \$15, and for registration \$10, and for a certificate for exemption \$5. Certificates or exemptions may be revoked if the holder be guilty of fraud or deceit in his practice, has been convicted of crime, is an habitual drunkard, or is grossly incompetent at his work. Nothing in the Act is to be construed as applying to duly qualified physicians, or to persons who although they sell spectacles, do not practise or profess to practise optometry.

The "Optologist."

SOME curious facts, which may well be pondered by our friends the "optologists," were recently related by Dr. H. W. Champlin to the Pennsylvania Homoeopathic Medical Society. It is now claimed that opticians possess instruments which render the use of cycloplegics unnecessary, and that ophthalmic surgeons are sadly behind the times in not knowing of and using them. It may be so,

but, as Dr. Champlin remarks somewhat trenchantly, "if they have them I fail to learn of it in reading their journals, though the advertising pages seem to have some suggestions of them." The "fogging" system (beloved of the optologist) and the ophthalmometer (a favourite instrument) are characterised as thoroughly untrustworthy. An optician who attempts to use the retinoscope is handicapped by the fact that he is not permitted to employ a cycloplegic. Case after case is quoted where the application of a cycloplegic converted an apparent myopia or myopic astigmatism into hyperopia or hyperopic astigmatism, the correction of which by suitable glasses relieved the patient's symptoms. What does the refracting optician do in like cases? This question is answered by Dr. Champlin from his records. That opticians rarely give unsatisfactory glasses is due to a well-known trick of the trade, which consists of prescribing a lens somewhere between 0 and the strength seemingly required. If the optician gives lenses up to the full correction accepted at the time, he is liable to be called upon to exchange the glasses for others or to refund the money, since the lenses will at times appear to blur the vision. Another trick is to reduce the strength of the lenses as prescribed by the medical man. An even shrewder plan is to change one lens alone, and to say that the other is correct, for this naturally impresses the patient with the superior knowledge of the optician. Dr. Champlin concludes a vigorous article with the significant words: "I have never found the work of the refracting optician right in any patient under forty-five years of age."

* * * *

Dr. Blanchart.

DR. BLANCHART, a member of the French Ophthalmological Society, has distinguished himself in the war in Morocco. He was mentioned in despatches, and decorated on the field of battle for his heroism in attending to the wounded under fire.

* * * *

Ophthalmia from Public Baths.

DR. HERBERT J. KNAPP, oculist to the Eastern Dispensary in New York City, reports an epidemic of contagious ophthalmia which he ascribes to bathing at the public baths in that neighbourhood. A sewer is stated to empty into the river a short distance above the incriminated bath. The Board of Health has taken action in the matter.

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Committee on Ophthalmia Neonatorum (British Medical Association).

THE Committee on Ophthalmia Neonatorum, appointed last summer by the British Medical Association, has now commenced its work. It consists of Mr. Sydney Stephenson (Chairman), Dr. R. C. Buist (Vice-Chairman), Dr. Cecil Shaw, Dr. Helm, Dr. C. J. Martin, F.R.S., Mr. Arnold Lawson representing the Ophthalmological Society, Dr. George

Carpenter (representing the Section for the Study of Disease in Children of the Royal Society of Medicine), Dr. H. Russell Andrews (representing the Obstetrical and Gynecological Section), and Dr. Ed. Sargeant (representing the Incorporated Society of Medical Officers of Health). The Central Midwives Board has not yet appointed a representative.

**The Central
Midwives Board.**

Speaking of ophthalmia neonatorum one may note that at a recent December 3rd meeting of the Central Midwives Board the names of no fewer than three women were removed from the roll, because they had failed to summon medical assistance in cases of the inflamed eyes of babies. It is impossible to be too stringent in a disease such as ophthalmia neonatorum. We cannot pretend to extend any sympathy to the delinquents.

Dr. WURDEMANN. DR. H. V. WURDEMANN, the editor of *Ophthalmology*, has moved from Milwaukee, Wisconsin, to Seattle, Washington.

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ORIGINAL COMMUNICATIONS.

SOME REMARKS UPON INTERSTITIAL KERATITIS, WITH
ESPECIAL REFERENCE TO PATHOGENESIS
AND TO TREATMENT.*

BY

SYDNEY STEPHENSON, C.M.,

London, England.

Generalities.

OF all the ocular manifestations of inherited syphilis, none is better known or easier to recognise than diffuse interstitial, or parenchymatous, keratitis. The disease, however, is not a common one. Greeff¹, who collected figures respecting 36,385 eye patients, found that interstitial keratitis had been diagnosed in 207—that is, in 0.77 per cent. of the entire number. Again, Collomb² had 170 cases, or 0.26 per cent., amongst 65,000 eye patients. Mohr³ had 187 cases, or 0.84 per cent., of interstitial keratitis among 22,013 patients seen during eleven years (1897 to 1907) at the Adele Brody Children's Hospital, Buda-Pest. My own figures from the Queen's Hospital for Children, London, E., tell much the same tale. Thus, amongst 5,142 eye patients 49, or 0.95 per cent., were affected. Since interstitial keratitis, as will be shown later, is essentially a disease of childhood, the proportion of cases at a children's hospital would naturally be somewhat higher than elsewhere. In short, it may be claimed without fear of contradiction that cases of interstitial keratitis, at an outside estimate, do not exceed 1 per cent. of all patients who attend a hospital or department for diseases of the eye.

Interstitial keratitis is most frequent between the ages of 5 and 18 years (Hutchinson) or of 6 and 15 years (Nettleship). The age-incidence of 97 cases of which I have preserved notes, arranged in quinquennial periods, comes out as follows:—

Period.	Number.	Percentage.
1—5 years	6	6.19
5—10 „	38	39.18
10—15 „	26	26.80
15—20 „	14	14.43
20—25 „	8	8.25
25—30 „	2	2.06
Over 30 „	3	3.09

It will therefore be seen that of my own cases four-fifths, or 80.41 per cent., occurred between the ages of 5 and 15 years. The greatest incidence (39.18 per cent.) was between the ages of 5 and 10 years. The disease is so rare after mature age has been reached that Sir Jonathan Hutchinson had never witnessed its occurrence later than 26 years. My series, however, includes one case in a woman of 36 years, whose syphilitic inheritance was attested by notched upper central incisors, rhagades at the angles of the mouth, vascular dystrophy, and a node upon the frontal bone, one inch above the outer end of the left eyebrow. I do not doubt that cases in older subjects could be found by anybody who took the trouble to search through the literature dealing with the disease.

* A communication read in the Section for Diseases of Children at the Annual Meeting of the British Medical Association, Sheffield, July 31st, 1908.

It should, perhaps, be noted that the figures given by Baker and Storey,⁴ as well as those by Ancke,⁵ form an exception to the general experience as to the age-incidence of parenchymatous keratitis, as stated above.

In my experience, interstitial keratitis is relatively more frequent in females than in males. Of my own cases, 97 in number, 38.14 per cent. were in males and 61.86 per cent. in females. Of Mohr's cases,² 187 in number, 48.12 per cent. were in boys and 51.88 per cent. in girls. Interstitial keratitis, therefore, has the same sex-distribution as juvenile tabes, also a tertiary or quaternary manifestation of inherited syphilis.

The disease has been known to surgeons for many years. It was, however, reserved for Sir Jonathan Hutchinson⁶ to show that it was "almost always a direct result of inherited syphilis," and, in particular, to draw attention for the first time to the diagnostic value of certain malformations of the teeth often met with in these cases. Hutchinson⁷ more recently has claimed that "interstitial keratitis in its typical form is always a consequence of syphilis, and is in itself sufficient for the diagnosis." Under the influence of Hutchinson's remarkable work, most English writers have assumed that practically all cases of interstitial keratitis are due to syphilis, inherited or acquired. This view, however, is too exclusive. Personally, I am persuaded that while parenchymatous keratitis in typical form is usually a manifestation of syphilis, yet a proportion of the cases are the outcome of other factors, of which the more important are tuberculosis, malaria, influenza, and (in animals) trypanosomiasis. In other words, interstitial keratitis is invariably the local manifestation of some general infective disorder, be it syphilis or otherwise.

A few figures may be quoted as to the relative frequency of inherited syphilis as a cause of interstitial keratitis :

Name.	Inherited Syphilis.
Davidson	20 per cent.
Alexander	35.3 " "
Fournier	41.5 " "
Michel	55 " "
Hirschberg	61 " "
Sæmisch	62 " "
Horner	64 " "
Pfister	64.6 " "
Nettleship	68 " "
Mohr	78.4 " "
Mauthner	78.4 " "
Bosse	81 " "
Silex	83 " "

The average of the figures quoted above from thirteen sources is 61 per cent. My own figures, which on this point deal with 101 cases, give inherited syphilis in 70, or 69.3 per cent. Broadly speaking, we shall not be far wrong if we claim that two-thirds of all cases of interstitial keratitis are due to inherited syphilis, a proportion that would be even higher if we included typical, bilateral cases only.

It is but recently that a share has been apportioned to acquired syphilis in the causation of parenchymatous keratitis. James Dixon⁸, who wrote in 1866, proposed, indeed, to replace Hutchinson's name, "chronic interstitial keratitis," by that of "syphilitic keratitis," since there existed, he claimed, "no special form of keratitis connected with acquired syphilis." In his famous memoir Hutchinson⁶ himself commented on "the entire absence of interstitial keratitis from the role of tertiary symptoms of acquired syphilis," although in a later

work he recognised the possibility of an acquired interstitial keratitis. Any carefully collected series of cases, however, will show that a certain number are associated with the acquired disorder. For example, among my 101 cases, 4, or 3.96 per cent., were, without doubt, due to acquired syphilis. Other figures follow:

Name.	Cases.	Acquired syphilis.
Collomb	170	1.76 per cent.
Pfister	130	3.8 per cent.*
Ancke	100	10.0 per cent.
Alexander	102	12.6 per cent.

It is important to note that such cases have been met with even in children (Mauthner and Trousseau). A personal example has been reported by me⁹ in a girl of twelve years, who had been affected with a chancre on the upper eyelid two or three months after birth.

Pathogenesis.

The discovery of the specific cause of the syphilis in the shape of the spirochæta pallida (Schaudinn and Hoffmann), preceded, as it was, by the recognition of the possibility of inoculating anthropoid apes with the virus Metchnikoff and Roux, has widened our conception of the morbid processes that lead up to the development of interstitial keratitis. The disease in question has been produced experimentally in certain animals, as the rabbit, the monkey, the sheep, and the dog, by the implantation of syphilitic products. For that matter, prior to the discovery of the spirochæta, Salmon¹⁰ observed keratitis and iritis thirty-three days after a monkey had been inoculated with a syphilitic papule from man. More conclusive were E. Bertarelli's¹¹ experiences. That observer found numerous spirochætes on examining a rabbit's cornea in which interstitial keratitis had been induced fifteen days after scarification with syphilitic material. The experiment did not end there. For Bertarelli produced keratitis in a series of fifteen or more rabbits by inoculating with material from the first rabbit, and, further, he set up a typical lesion in the macacus from one of the affected corneæ. A beautiful illustration of the keratitis produced by Bertarelli in the rabbit will be found in Hoffmann's recently published *Atlas*¹² (plate VII, figs. 3 and 4). Scherber and v. Benedek¹³ produced nodular iritis and interstitial keratitis by inoculating the anterior chamber of a rabbit's eye with syphilitic virus. When examined microscopically, the deeper layers of the cornea showed an infiltration chiefly of mononuclear cells, including some newly-formed vessels. The appearances are shown in Hoffmann's *Atlas* mentioned above¹² (plate VIII, figure 3). Most suggestive experiments were reported during the course of 1906 by Greeff and Clausen,¹⁴ who inoculated the eyes of apes and rabbits with syphilitic material, and after the lapse of some weeks, observed the development of a species of interstitial keratitis. In the earlier cases numerous spirochætes could be demonstrated, but the organism could not be found in the more advanced cases. The authors concluded that the corneal opacity was the outcome of a leucocytic invasion, which first attacked and eventually destroyed the micro-parasite. In a second communication¹⁵ Greeff and Clausen concluded that the pathogenic agents of syphilis multiplied in the cornea, and thus caused an invasion by leucocytes, which finally exterminated the micro-organisms. Hoffmann and Brüning^{16 17} produced keratitis by the inoculation of a rabbit's eye with a morsel from a human chancre, and obtained a somewhat similar result when an emulsified chancre was introduced into the anterior chamber. Smears from the diseased

* 2.5 per cent. certain and 1.5 per cent. somewhat doubtful.

cornea, when stained by the Giemsa method, showed the spirochæta pallida, thereby proving the essentially syphilitic nature of the keratitis. Hoffmann and Brunig,^{16 17} have recently succeeded in producing keratitis by inoculating the anterior chamber of a water-spaniel and a pug-dog respectively with particles of a human chancre. Spirochætes were found in sections of the cornea (stained by Giemsa) from the second animal.

The experimental work described above leads one to believe that syphilitic interstitial keratitis is due to the presence (at least, in the early stages) in the parenchyma of the cornea of the causal agent of syphilis, in the shape of the treponema pallidum. The chain of proof, nevertheless, is still incomplete, inasmuch as the treponema has yet to be demonstrated in the cornea of patients suffering from interstitial keratitis. It is not easy to obtain material in these cases, since eyes are seldom, if ever, removed during the height of parenchymatous keratitis, neither do the patients usually die during the course of that disease. Personally, it is true, I have failed to identify the treponema in scrapings from diseased cornea, but, then, superficial parts only were removed. In the future I hope to have an opportunity of examining the aqueous humour bacteriologically, for I feel tolerably certain that in severe cases of interstitial keratitis, complicated with irido-cyclitis, that fluid will be found to contain the treponema. Although the spirochæta for a long time escaped detection in tertiary lesions, of which interstitial keratitis is an example, yet it has now been discovered, more especially in the fibrous periphery of gummata (Hoffmann). There is an interesting analogy between syphilitic keratitis, on the one hand, and the keratitis observed in dogs and goats affected with nagana and dourine, two diseases closely allied to, if not identical with, sleeping-sickness, on the other. In these animals the corneal changes have been shown by Morax¹⁸ and by Stock¹⁹ respectively to be due to the growth of the trypanosome in the interlamellar spaces of the cornea. What is true of trypanosomiasis is probably also true of syphilis.

Until recently, it has been difficult or impossible to explain the latency of the corneal manifestations of inherited syphilis. A child might be apparently in perfect health for five, ten, or fifteen years, and then, perhaps as the result of some trivial injury or slight general illness, develop interstitial keratitis. We now know that the tissues of the syphilitic fetus or baby are literally flooded with the treponema. Such organisms as escape the liver are distributed by the fetal circulation to every part of the body, where (other conditions being favourable) they determine this or that specific lesion. The organisms have been found in practically every syphilitic lesion that has yet been examined with the microscope.*

As regards the eye, certain findings are highly suggestive from our present point of view. Thus, Hans Bab²⁰ examined the eyes of three specific still-born babies, and found spirochætes in all the tissues of the eye, with the exception of the vitreous humour, the ciliary processes, and the crystalline lens. It is to be noted that the substantia propria of the cornea, especially in its deeper layers, showed tolerably numerous organisms. Bab points out that the distribution of the spirochætes explains well enough some of the clinical peculiarities of the ocular manifestations of inherited syphilis. For example, the localization in the deeper layers of the cornea accords with the well-known facts that the investing epithelium remains practically intact in interstitial keratitis, while ulceration of the cornea is uncommon. The distribution of the vessels in the tunica vasculosa, again, explains why specific choroiditis is

* Muhlens examined 31 fetuses, the history of which was unknown to him, and found spirochætes in 15, and in every instance found that the accuracy of the microscopical diagnosis was borne out by the ascertained clinical facts.

commoner towards the periphery than towards the centre of the fundus. Lastly, the freedom of the crystalline lens from spirochaetes explains the immunity of that body from syphilitic lesions. No tissue changes were found in Bab's specimens.

By some other observers, including Peters, Gierke, Stock, and myself, spirochaetes have also been demonstrated in the seemingly unaffected eyes of syphilitic fetuses and babies. A coloured picture of spirochaetes in the deeper layers of the cornea of a macerated syphilitic foetus will be found by those interested in the subject in Hoffmann's *Atlas*¹² (plate XXVII, figure 1).

H. Schlimpert²¹ made observations upon the eyes of two children, the offspring of undoubtedly syphilitic mothers. One was still-born, and the other died at the age of two weeks. Spirochaetes were found, among other parts, in the cornea, iris, and choroid, and it is interesting to note that tissue changes, believed by the author to indicate a chronic or sub-acute inflammation, were also present.

It thus appears that if the child survive, the spirochaetes (possibly in some intermediate morphological form) lie dormant in the cornea, iris, choroid, and other parts of the eye. They cause no mischief, until some determining cause, of a local or general nature, lowers the resistance of the tissue, and allows the treponema to get the upper hand. The result is an attack of interstitial keratitis, of iritis, or of choroiditis, as the case may be.

It has been maintained by some authors, as Panas²², that interstitial keratitis is a dystrophic manifestation, the indirect cause of which is to be sought not only in ancestral syphilis but also in lymphatism, scrofula, gout, and arthritis. Samuel D. Risley²³, again, has espoused the dystrophic view, and has reported a couple of cases where the keratitis was apparently connected with symptoms of myxoedema and relieved by the administration of thyroid gland.²⁴ On pathological grounds, an attempt has lately been made by Elschnig²⁵ to justify the dystrophic theory. He examined microscopically the eyes of a girl, 8 years of age, both of whose eyes were affected with keratitis. As a result of his investigations, Elschnig suggested that the cause of the corneal changes was to be found in a disturbance of nutrition, due either to syphilitic endarteritis or to impregnation of the lymph with syphilitic toxins. He rejected the idea that interstitial keratitis could be caused by lodgment of spirochaetes in the substance of the cornea.

From this view I am compelled to dissent. On the experimental and pathological evidence brought forward it must, I think, be concluded that interstitial keratitis is really an infection of the tissues of the cornea with this or that specific micro-organism, of which by far the most common is the *treponema pallidum*. Other infections are those by the bacilli of tubercle and influenza, the plasmodium malaria, and the parasites of trypanosomiasis. In short, I conclude that the keratitis represents an infection as sharply distinguished from a mere dystrophy.

Treatment.

The keratitis of heredo-syphilis is little under the influence of so-called "specifics," as mercury and iodine, at all events when given in the usual way by the mouth†. Who has not seen the second eye become affected even when

²¹ Corneal changes in myxoedema have been reported by Grunstedt²⁶ and by E. T. Collins²⁷ respectively.

† I have sometimes had happy results from injection of the intra-muscular or intra-venous injection of the cyanide or bimiodide of mercury.

the patient was fully under the influence of mercury? This fact is tacitly recognized by ophthalmic surgeons, many of whom give nothing but some mild tonic preparation of iodine, of which in this country the favourite is the syrup of the iodide of iron. The chief dependence is placed upon local treatment of the disease by means of atropine, dionine, and fomentations. As regards internal treatment, the situation, as usual, is accurately summed up by Professor Fuchs:²⁷—"Unfortunately," he states, "we must say that, in general, treatment is pretty nearly powerless against this disease."

For several years I have known that arsenic, administered in the form of Donovan's solution, exercised a favourable influence upon lingering cases of parenchymatous keratitis. That old-fashioned remedy has often rendered me yeoman service. For some time, however, I have replaced the Donovan's solution by atoxyl, an organic compound highly charged with arsenic, believed to be almost a specific in cases of sleeping sickness. I have employed atoxyl by intramuscular injection, twice or thrice a week in severe cases, and once a week in milder ones treated in the out-patient room. The substance is best dissolved in water, 1 in 6, and solutions should be fresh, since they do not keep well. Formerly, I employed massive doses (0.75 to 1.5 grammes), but I soon found that they were apt to cause vomiting and to set up severe colic. The dose for an injection does not now exceed in my hands 0.25 to 0.50 gramme—that is to say, about $\frac{3}{4}$ to $\frac{7}{8}$ grains. A course consists of some twelve injections, and the total amount of atoxyl does not exceed six grammes. In addition to the atoxyl, I usually administer some preparation of mercury by the mouth—as a rule, mercury with chalk, say, one grain three or four times a day. By these means I have obtained results never even approached by any of the methods hitherto employed by me. Atoxyl by itself, in my experience, does not succeed so well as the combined treatment, although that obviously is not the same thing as saying that it is devoid of action in these cases. Under any circumstances, the administration of mercury is most important, if only for the purpose of preventing the development of other quaternary manifestations of heredo-syphilis—as, for example, choroido-retinitis, gummata, juvenile tabes, or tabo-paralysis.

Brief details of a few cases treated by atoxyl will show better than many words what results can be obtained from the remedy:—

Case No. 1.—Amelia H.—, 8 years, first seen at the Evelina Hospital, London, on April 14, 1908. The sight of the right eye had been getting cloudy for five days without known cause. The patient was the only surviving member of a family of six children, of whom three were still-born and two died in infancy. Both knees were affected with painless synovitis. No other definite evidence of heredo-syphilis could be elicited. As regards the eyes, there was photophobia, and the right cornea was generally dull and steamy, and several interstitial deposits were present. The iris was greenish, and the pupil sluggish. Mercury with chalk (gr. i ter die) internally, and atropine (grs. iv) locally. Matters failing to improve, atoxyl (grs. iv.) was injected on May 7th, and one week later the right cornea was almost clear, but the left had meanwhile become affected. Injection (grs. iv.) repeated on May 12th. On May 16th the left eye watered, was red, and painful at night. The lower two-thirds of the cornea was slightly dull, and its upper third showed a denser interstitial opacity. Atoxyl injection repeated on June 2nd. On June 10th atoxyl discontinued, since both eyes looked almost normal, and it was only by attentive examination that any opacity could be recognised even in the left cornea.

Case No. 2.—Dorothy F.—, 6 years, first seen at the Evelina Hospital on January 21, 1908, on account of the right eye which was affected with parenchymatous keratitis. The syphilitic nature of the patient was attested by pronounced frontal "bosses," Parrot's cicatrices, and thickening of the upper third of the right tibia. There had been a single miscarriage; patient was one of three living children. The case was treated with mercury and chalk internally (gr. i ter die) and atropine locally until February 4th, when the second eye showed signs of inflammation. Atoxyl (grs. ii) was then injected, and repeated on February 18th, 25th, March 10th, and 16th in ascending doses of grs. iii, iv, and vi. On the last date it was noted that the child saw well with the left eye but not quite so well with the right. The right cornea was almost clear, although the eye was rather red and the pupil only of medium size. The left cornea was free from opacity, the eye was not red, the pupil was well dilated, and there was no photophobia. Injections of atoxyl repeated on March 24th, 31st, April 7th, 14th, and 28th, May 12th, 19th, and June 2nd. On June 23rd, 1908, after thirteen injections of atoxyl,

space after a period of seventeen weeks, the left cornea appeared to have made a complete recovery, while the right cornea manifested a faint dulness only in the lower-outer quadrant.

Case No. 3. Jessie C. — 5 years, attended the Evelina Hospital on February 25th, 1908, both eyes being affected with interstitial keratitis of medium severity. So much photophobia ("reflex blepharospasm") was present that it was necessary to administer ethyl chloride before the eyes could be fully examined. Family history suggestive of syphilis, as was also the fact that the patient's father was said to have suffered from "psoriasis" for about five years. The personal evidence of syphilis included, besides facial stigmata, deafness of three months' duration. Mercury with chalk (gr. 1 ter die) and atropine. Between March 17th and June 8th ten injections of atoxyl were made, one of 3 grains, four of 4 grains, and five of 5 grains. Improvement in the condition of the eyes noted after the first injection. On June 23rd, 1908, there was no redness of the eyes, while the cornea showed merely a slight more or less central opacity.

Case No. 4. Lena L. — 14 years, first seen on September 25, 1907, with the history that four years ago both eyes were inflamed for about a month. On the present occasion both eyes had been bad for about four weeks, one shortly after the other. Despite treatment carried out in Tunis (where the girl was attached to a French theatrical company) the eyes have become steadily worse, so that at the present time scarcely enough sight is left to guide herself about unfamiliar places. On examination, typical and severe interstitial keratitis. R.V. 1.60, L.V. 2.60. Forehead "bossy," with transverse constriction above eyebrows. *Café au lait* complexion. Upper central incisors and all four first permanent molars showed specific characteristics. Patient treated with mercury and chalk until February 20, 1908—that is for a period of nearly five months—without striking or noteworthy improvement. Since that date 12 injections deeply into buttocks of atoxyl, 1cc. to 2cc. of a 1 in 6 aqueous solution being used on each occasion. On March 28th the girl's mother volunteered the statement that "it was quite a pleasure to see Lena get about the house without knocking into things." V. was then equal to 5.18. The injections, however, were stated always to be followed in an hour or so by pain in the stomach. After the last injection, made on 8th April, 1908, sight had risen to 5.12, while the patient could read with case No. 1 type on Jaeger's scale. Faint scattered nebulae, more marked in right cornea. No synechia, but a few scattered pigment dots on left lens. The last note of this case, made on 13th June, 1908, runs as follows:—R.V. 5.12 and No. 1 Jaeger. L.V. 5.9 and No. 1 Jaeger. No redness of eyes. Faint scattered nebulae, especially of right cornea. Hirschberg vessels in right cornea. No posterior synechia, although a few pigment dots are present on the anterior capsule of the left crystalline lens. The improvement after twelve injections spread over two months was extraordinary, and something for which my former experience of interstitial keratitis afforded no parallel.

Case No. 5. Mary F. — 13 years, came under my notice on December 20th, 1905, suffering from syphilitic interstitial keratitis of the left eye, the sight of which was reduced to less than one-tenth. Attendance was irregular, and the patient was lost sight of until July 24th, 1907, when she came with a most unusual appearance of the right cornea. The lower third of the right cornea was occupied by a "salmon patch," so prominent as at first glance almost to suggest a new growth. The cornea immediately above the "salmon patch" was more or less opaque, but the upper half or so of the cornea was clear. V. 5.0. Tension minus one-half. The left cornea, formerly affected with interstitial inflammation, had recovered vision of two-thirds. In the further progress of the case, despite treatment with mercury and chalk in liberal doses, the whole of the right cornea became vascularized, so that no trace of pupil or iris could be made out, and sight fell to hand-reflex only. On November 27th, 1907, the left cornea showed signs of recurrence. On February 22nd, 1908, R.V. tingers at 3 metres; L.V. hand-reflex. The right eye was free from redness, and the central parts of the cornea were occupied by a dense opacity. The left eye was slightly red, and the cornea was universally cloudy. Upon this date (February 22nd) injections of atoxyl were commenced, and nine such injections made by April 8th following. A 1:20 solution was employed, and 2 c.c. given on every occasion except two, when the smaller doses of 1 c.c. and 1.5 c.c. were administered. Matters improved sensibly after the second injection. On March 21st, R.V. 5/60 and L.V. 1/36. On April 8th, R.V. 5/36 and L.V. tingers at 0.5 metre. By May 6th, 1908, matters had improved to R.V. 5/36 and No. 12 Jaeger, and L.V. tingers at 3 metres and less than No. 20 Jaeger. The eyes were free from vascularity. I have no further note of this case, but the impression left on my mind is that very considerable improvement was effected by atoxyl.*

Case No. 6. Frederick J. — 9 years, first seen on September 18, 1906, with the history that his left eye had been inflamed for about a month after a trivial injury with a bit of rotten wood. Patient, the fourth in family, had been preceded by three living babies. He was followed by three misarranges at the seventh month. There was a history of congenital syphilis. The personal stigmata of syphilis included: 1, rhagades; 2, *café au lait* complexion; 3, state of first molar in right upper jaw; 4, highly arched palate; and 5, slight fluctuating deafness, worse since eye had been bad. The left eye was severely affected with parenchymatous keratitis, and its sight was reduced to recognizing fingers when held close to the patient's face. Under the usual treatment, the left eye improved, and the mother, believing the child cured, ceased attending on June 11th, 1907. Some six months later (December 17th, 1907) the lad was brought with the statement that his right eye had been inflamed for about a week, following an "influenza cold." On examination, the right cornea was more or less cloudy, with a "salmon patch" above. Photophobia. Slight redness of eye. Tension normal. V. tingers close to face. The left eye, affected when the lad first came under notice,

*Patient again seen on August 13th, 1908. Eyes free from redness. Central interstitial opacities especially of left cornea, but iris, pupil, etc., can be readily recognised. R.V. 6/30 and No. 1 Jaeger. L.V. 3/60 and No. 12 Jaeger. General health excellent.

had recovered V. almost two-thirds normal. On January 14th, 1908, the condition was most serious. The keratitis had recurred in the left eye. There was marked reflex blepharospasm, and the eyes watered on the least exposure to light. R.V. perception of light. L.V. fingers at one foot. Tension slightly *minus*. "Salmon patch" upper segment of each cornea, the rest of which was cloudy, especially as regards the right one, which resembled "ground-glass." There were complaints of severe pain. The patient's condition was pitiable in the extreme. He was admitted to the Evelina Hospital, where he stayed until May 2nd, 1908. On February 4th, 1908, the left cornea was vascular and cloudy, so that a glimpse only of the underlying parts could be obtained. V. hand-reflex. The condition of the other cornea was still more parlous. A bit of cornea, grey like wash-leather, remained towards the centre, the remainder of the membrane being occupied by a large "salmon-patch." V. perception of light. Much reflex blepharospasm. Under chloroform, peritomy was performed on the right eye, no conjunctiva being taken away, but radial slits being made in the parts dissected up. The immediate effect of the operation was to reduce markedly the gross vascularity of the cornea. During the rest of the lad's stay in hospital atropine and Iodine were applied to the eyes, and twenty injections of atoxyl were made into the buttocks. The dose varied from 5 grains to 10 grains. Vomiting and severe colic were noted after the more massive injections. When patient was discharged, after a stay of nearly four months, R.V. 1/30 and L.V. 6/60. The right cornea was somewhat cloudy and the eye a little red. The left cornea also was cloudy. The lad was seen only the other day (July 25th, 1908) when his condition was as follows: R.V. 3/60 and No. 6 Jaeger. L.V. 6/36 and No. 7 Jaeger (pupils under atropine). Tension normal. No redness of eyes, photophobia, or lachrymation. Cornea slightly cloudy, with Hirschberg vessels especially in the right one. One posterior synechia in right eye. No fundus changes, but right fundus not seen very well.

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CLINICAL MEMORANDA

A CASE OF SUPPURATING JOINT AFFECTION
FOLLOWING OPHTHALMIA NEONATORUM.

BY

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THE occurrence of suppuration of joints as a result of general infection by the micrococcus gonorrhoeae in connection with ophthalmia neonatorum is so uncommon that the following case may be fully reported.

Case.

R. G., aged 3 weeks, was seen at the Out-Patient Department of the Eye Infirmary, Charlotte Street, Glasgow, on account of redness and swelling of the eyelids of the left eye, accompanied by a profuse purulent discharge. The mother stated that the first appearances were noted about the tenth day after birth. The disease rapidly assumed a serious aspect, and, after trying all her homely remedies without avail, the mother brought the child to the Infirmary.

Left eye.—The eyelids were much congested and tumified, the upper overlapping the lower by about 1 mm., and the lower being excoriated where the upper overlapped it. Profuse watery purulent discharge flowed from under the upper lid down the cheek.

On evertng the upper lid, which was done only with considerable difficulty, it was found that there was a layer of creamy membrane adherent to it. When this was separated from the conjunctiva, the latter bled slightly, but the separation was easily effected.

The conjunctiva presented the usual appearances seen in cases of ophthalmia neonatorum, being thrown into folds and very rough looking. The cornea was clear and remained so throughout.

The amount of discharge was much greater than is usually seen in cases of diphtheritic ophthalmia, and smear preparations were at once made.

In the smear preparations the gonococcus was identified, but with it several long thin bacilli which were not identified (larger than the Koch-Weeks' bacilli).

Right eye. This eye showed evidences of an early stage of infection and rapidly developed a state similar to that of the left eye.

Under treatment, which included copious washing with a mercuric lotion and the use of a mercuric oxide ointment with atropin, the discharge from both eyes greatly diminished in five days, but on the seventh day a recrudescence took place in the right eye. The child was very thin and weak looking. On the eleventh day the left eye was greatly improved, but the right was much swollen and continued so for a week longer.

On the 22nd day (32nd of the disease, both eyes being nearly well, the right less so than the left, the mother called attention to the fact that the left forefinger and the right great toe were much swollen. They were livid in colour, presented a shiny appearance and fluctuation was manifest in both. The mother had noted the redness only the day before. The joints did not appear to be very painful but the child's general condition was very bad. The temperature was just over 100° F. So far as one could judge, the swelling

was most intense round the carpo- and tarso-phalangeal joints. Suppuration being manifest the child was sent to the Sick Children's Hospital, where the joints were opened by Mr. Rutherford. Subsequently a swelling appeared in the palm of the right hand and was opened, and a fortnight after the first sign of general infection made its appearance, the right knee became swollen but did not suppurate. All the operation wounds healed readily and rapidly, and the child eventually recovered well. Preparations of the pus from the joints showed the presence of the gonococcus.

The child was seen eight months after recovery was complete, and presented all the appearances of a healthy sturdy child. The joints affected were all perfectly active, the only evidence of the past illness was a slight puckering in the forefinger of the left hand.

Remarks.

This case, then, presents several unusual features.

The date of beginning of the eye affection was late for ordinary gonococcal ophthalmia neonatorum and there was in each eye a membranous formation not unlike that sometimes seen in ocular diphtheria.

Further, there was evidence of the presence of more than one type of micro-organism in the discharge from the eyes, and the question arises as to whether or not there was a true mixed infection. The bacillus present was not, unfortunately, identified by culture, but its appearance was not that of the Klebs-Loeffler bacillus.

Sydney Stephenson, in his monograph on *Ophthalmia Neonatorum* (page 142), calls attention to the fact that the infection is frequently a mixed one when joint affections follow general infection after ophthalmia neonatorum, and his observation is apparently borne out by this case. It is specially interesting and important to note that the gonococcus was found in the pus taken from the joints, as indicating that this organism was at all events the principal one as concerns the infection.

In this case the involvement of the small joints appears to be unusual, as does also the fact that suppuration supervened.

A striking feature of the case was the aspect of the child, who appeared to be very seriously ill. So threatening were the appearances that I had grave doubts as to whether the little patient would survive; but when the pus was evacuated, the child improved greatly, and, later, when the swelling of the knee did not break down, the state of matters looked quite hopeful.

The ultimate result, however, was satisfactory beyond my most sanguine expectations, as I thought it probable that the joints, so seriously involved, would be more or less defective for a long time after.

A CASE SHOWING THE EFFECTS OF OBSTETRIC INJURY OF THE CORNEA, OBSERVED IN AN ADULT.*

BY

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WITHOUT doubt, many cases of deeply-lying linear opacities of the cornea, in healthy individuals, may be ascribed to injury at birth, yet, because it is so difficult to obtain accurate information of an occasion so remote, and in the

*Read in the Section on Ophthalmology, College of Physicians, Philadelphia, November 10th, 1908.

absence of a satisfactory history, we are forced to conclude that the lesion was congenital or pre-natal in origin. But when, however, we find, in addition, the scars of forceps injury on the face and head, we may be certain that the cornea, too, had been damaged at the time of birth. The following history quite satisfactorily illustrates the connection.

A young woman of about 20 years applied for relief of asthenopia and of blurred sight in her right eye. She had recently become a typewriter; but she was unable to follow a copy placed at the right, and she could not follow a line without dropping letters. She was comely; but her face and forehead were distorted and showed deep loop-like scars along the fronto-temporal lines on each side. Her eyes were unequally prominent, as though the orbits were too shallow. On inquiry, it was learned that her birth was a most difficult one, lasting many hours, and completed only by instrumental delivery. For several days her head had remained mis-shapen; the right eye projected far out of the orbit, and for weeks it was red and uncovered.

On examination of her right eye, a singular fibre-like opacity was noticed, extending vertically down the posterior layer of the cornea. At first, I thought I had to deal with a case of persistent pupillary membrane, but on attaining wide mydriasis, the fibrous opacity was seen to be in the substance of the cornea. The fibre was branched like a curved Y, bending over the nasal half of the cornea. At the temporal half, near the limbus, were two short straight fibres, one pointing upwards, the other downwards.

These opacities were in the posterior portion of the cornea; they were highly refractive and appeared to project into the chamber, like the dripping flaws on the inside of a glass bottle. As might be expected, there was marked irregular astigmatism, which could be demonstrated by retinoscopic shadows. It was only after repeated examinations that I could satisfy myself that the fibres were in the cornea. The use of a mydriatic showed that there was no connection whatsoever with the iris.

There was slight chorio-retinal disturbance, such as one sees in over-used, uncorrected, ametropic eyes. The vision was brought from 5/50 to 5/20 by a -2.50 Cyl. lens axis 90°.

This singular corneal lesion must be looked upon as the result of injury to the eye at the patient's birth. A degree of pressure with the forceps, sufficient to cause the deep temporal scars, likewise, must have caused a rupture of the posterior corneal layers and the elastic lamina. It may be presumed that the torn portion was very early sealed by fibrin, the excess of which caused the projection on the posterior surface. The anterior surface of the cornea was smooth, and neither opacities nor infiltration could be made out in the epithelial, subepithelial, nor in the outer zone of the laminae.

This series of corneal opacities was undoubtedly caused by ruptures in the membrane produced by direct pressure upon the eyeball. No history from the attending physician could be obtained, yet the girl's father may be believed when he stated that the eyeballs protruded for several days after her birth. The inference is justified because of the depression of the cranium and the deep scars still evident. It is quite singular that the left eye should have escaped injury, although it, too, is slightly prominent.

SARCOMA OF THE BULBAR CONJUNCTIVA*

BY

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Introduction.

THE conjunctiva is subject to the same malignant growths as may be found in mucous membranes of any other part of the body. The greater number are of the type of epithelioma.

Noyes reports having found forty-eight epibulbar growths: seventeen from the conjunctiva and thirty-one from the limbus. Strause tabulates true sarcoma of the limbus. Panas holds that the so-called sarcomatous forms are really epitheliomata of rapid growth. Kershbaum tabulates sixty-seven cases of sarcoma of the conjunctiva, nine of which were epibulbar; five of these were leucosarcomas, two were leucosarcomas with hematogenous pigmentation, and two were melano-sarcomas. Fuchs claims that the sarcomata of the conjunctiva are almost always pigmented, differing in this respect from the epitheliomata; yet pigmented epitheliomata do occur.

The predilection for both epitheliomata and sarcomata of the conjunctiva is the boundary line between the conjunctiva and the cornea.

In the *Ophthalmic Record* of October, 1908, Dr. Julius Gross reports a case of melano-sarcoma of the limbus in a female, aged twenty-one years. He shows the researches where Lyder Brothers found eight cases in fifteen thousand cases of diseases of the eye. Clegg and Hall state that but three cases were observed in five hundred and twenty thousand, five hundred, and twenty-three out-patients in the Manchester Royal Eye Hospital. Verhoeff and Loring found two cases in forty-one thousand, seven hundred, and nineteen patients treated in the Massachusetts Charitable Eye and Ear Infirmary.

Case.

Edna N., aged 15 years, came to Wills' Hospital on September 16th, 1908, giving the following history:—a red spot, which had been gradually getting larger, had been coming on the outer side of right eyeball for several years. She desired to have it removed.

Examination showed a raised, flat, pink, papillary mass, about 3 mm. in diameter, slightly elevated and soft to the touch. It was nearly circular, with numerous vessels radiating to and from it. It was free from any scleral adhesions, and was covered with shining conjunctiva. The growth was situated 4 mm. to the outer side of the limbus.

The patient was admitted to the Hospital and prepared for removal of the growth, which was done four days later. The specimen was placed in the care of the pathologist, Dr. Harold G. Goldberg, for examination.

The patient made an uneventful recovery and was discharged September 23rd, 1908, apparently cured. Vision in each eye equalled $\frac{1}{2}$.

Pathology.

Dr. Goldberg reported the specimen to be a small round-cell sarcoma vascular and extending into surrounding tissues. The external surface was covered with degenerated epithelium. His final report was as follows:—

"The notable points of difference presented by this case were: its

* Read before the November, 1908, meeting of the Wills' Hospital Ophthalmic Society.

occurrence in a child 15 years of age, far below the average age; its location at a point much further from the corneal limbus than usual; and its mixed type, round and spindle celled. In addition, the growth was non-pigmented, it had a fairly broad base, and it appeared to be invading the surrounding conjunctiva. It was quite vascular and somewhat alveolar in type, although not markedly so. The subconjunctival tissues were thickened, and while there was a proliferation of the fixed connective-tissue elements, this was not sarcomatous in nature, and not sufficiently pronounced, so that by contrast the line of demarcation was well seen."

"I believe these findings would indicate that the growth was spreading surfaceward towards the cornea, perhaps, as is usual, and not intraocularly, as is more to be feared. I would, however, look upon the growth as malignant, although the case might be considered by some as supporting evidence of the benignancy of such growths in this location."

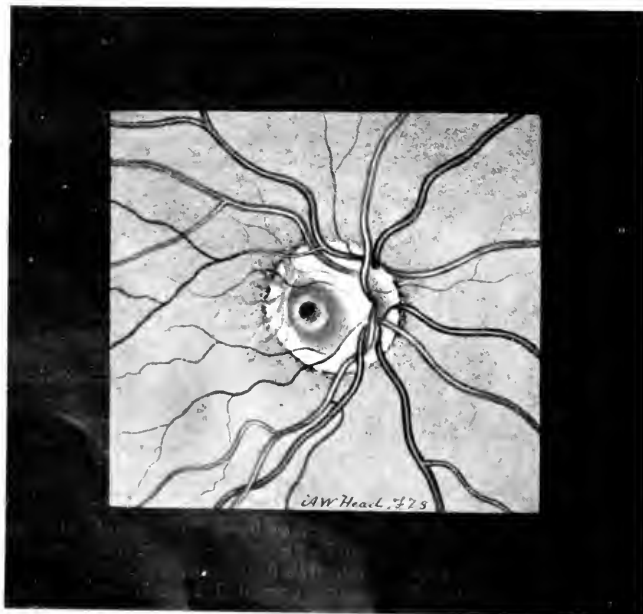
CRATERIFORM HOLE IN THE OPTIC DISC.*

BY

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THE following is an instance of a rare congenital malformation of the optic disc, examples of which have been described in this country by R. Marcus



Gunn,¹ W. Adams Frost and myself,² and Ernest Thomson and A. J. Ballantyne³. The facts follow :—

A girl, aged 10 years, was seen at the Evelina Hospital, London, on October 20th, 1908, on account of frontal headaches, double vision, and complaints that everything looked "spiky." She was an only child and of a neuropathic temperament. On examination: R.V. = 6/6, L.V. = 6/6. The anomaly affected the optic disc of the right eye, and took the form of a polygonal area of greenish hue, situated on the outer side of the papilla, close to the line of junction between the last named and a conspicuous crescent marked with choroidal vessels (*see figure*). The polygonal patch was slightly depressed as compared with the rest of the disc, and it included a smaller semi-circular area. The appearances evidently represented two excavations in the substance of the optic disc, the larger, a comparatively shallow one, and the smaller, a deeper one. Lying anterior to the excavation was a layer of extremely tenuous tissue, difficult to recognise with the ophthalmoscope. Retraction (estimated under atropine): R.V. = 6/36, *plus* 1·5 D. sph. = 6/5 pdly. L.V. = 6/60 *plus* 4·0 D. sph. = 6/5 pdly.

Remarks.—According to a recent communication by Wilh. Reis,⁴ the anomaly described above is very rare, although he has himself met with five cases among about 55,000 eye patients seen during nearly ten years at Bonn. He comments upon the fact that so typical and characteristic a malformation should be so little known. He has tabulated fifteen published cases in addition to his own five cases, and, on analysis, it appears that of the twenty cases, thirteen were in females, six in males, and in one case the sex was unknown. One eye, as a rule, is affected, but in Stood's second case⁵ both were involved. More than a single hole may be present in one and the same disc, as in Wiethe's case⁶ and in one of Reis's cases also.⁴ The hole is generally found near the periphery of the temporal half of the disc, which in that position may show a localised extension, as in Thomson and Ballantyne's case³ and in one of Reis's cases.⁴ The holes vary, as might be expected, both as regards dimensions and depth. In Lichtenstein's case⁷ the bottom of the hole could be seen with a *minus* 24 D. lens, an observation rendered possible by the existence of a small vessel lying at the bottom of the pit. The excavation usually possesses a dark colour, owing to the shadow cast from its edges. In a majority of the recorded cases, sight with suitable correction has been normal or almost normal.

There is a general tendency among authors to regard the anomaly described above as an example of incomplete coloboma at the optic disc. Coats⁸ has published an account of the pathological examination of two cases thought to be examples of "crater-like hole" of the optic disc. The condition arises, he believes, "by the evagination of a portion of the secondary optic vesicle into the nerve, or, more probably, by the abnormal differentiation of a part of the neural division of the vesicle into pigment epithelium and retinal elements." Such an abnormality, in Coats' opinion, has no necessary connection with the foetal cleft.

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- (4) Reis, Wilh. *Zeitschrift für Augenheilkunde*, Juni, 1908, p. 505. Abstract in THE OPHTHALMOLOGIST, November, 1908, p. 912.
- (5) Stood. — *Klin. Monatsb. für Augenheilkunde*, 1884, p. 285.
- (6) Wiethe. — *Arch. für Augenheilkunde*, 1882, Bd. II.
- (7) Lichtenstein. — *Centralbl. für prak. Augenheilkunde*, 1907.
- (8) Coats, George. — *Royal London Ophthalmic Hospital Reports*, January, 1908.

NOVELTIES.

A NEW PERIMETER.

By

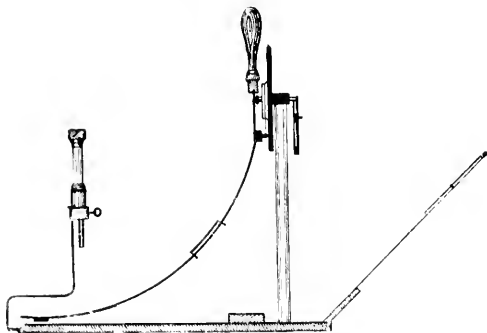
P. H. ADAMS, F.R.C.S.,

ASSISTANT SURGEON TO THE EYE HOSPITAL, OXFORD, ENGLAND.

MOST of the automatic self-registering perimeters in use at present possess certain disadvantages. Amongst these are: excessive weight, in spite of which they are not over steady; complicated machinery, difficult to repair if it gets out of order; noisy working of the carrier, which attracts the patient's attention before the object comes into view, and, in addition, the pricker is so near the turning handle that scratches on the hand are not unusual; and, lastly, the cost of them is considerable.

To obviate these drawbacks, I have had a perimeter made for use which avoids most of them.

The instrument is made almost entirely of wood, thereby ensuring lightness; the arm is made of old dry wood, especially prepared to prevent warping, and along this a light metal carrier travels very quietly. The whole instrument stands on a broad piece of wood, thus avoiding any tendency for it to overbalance. The carrier is moved by turning the big wheel, the hand being thus well away from the fixation point and



nowhere near the pricker. This wheel is connected to the small pulley which works the pricker carrier on the short arm. There is hence no possibility of the two not working together, and yet there is no complicated machinery or gearing to get out of order. The whole instrument is coloured a dead black, thus avoiding all reflections from the arm, and at the same time rendering the object visible by contrast as soon as possible. The carrier is made to allow cards with various sized and coloured squares to be inserted, the largest square possible being one of 6 centimetres. An adjustable chin-rest and a box to hold the cards complete the instrument. The only difference in working as

compared with a perimeter of the McHardy type is the fact that both hands are necessary whilst working the carrier, as, although the arm is counterbalanced, it requires steadying with the other hand to keep it in position.

The price of the instrument is £3, and it is made by E. H. Mathews, 3½, Queen Street, Oxford

A NEW RETINOSCOPE.

THE instrument shown in the illustration is creating considerable interest, by reason of the effort made by the inventor, Mr. Angus Macnab, and the maker, E. B. Meyrowitz, of London, Paris, and New York, to effect greater precision in retinoscopy.

The accurate observation of the shadow movement is often rendered difficult by appearances caused by the form of the source of light, and the mirror is designed to produce a band, convergent and therefore intensified and sharp as regards its shadow edge, but plane in movement. This band can be made to lie in the axis of the astigmatism by rotation, and the movement is made along the line of the band which represents the meridian being tested. The scale at the back of the instrument indicates the axis of this meridian, and after a very little practice it can be determined to within 5 degrees.

The amber mirror is a distinct improvement on the ordinary form, as in projecting light, approximately monochromatic, the definition of the shadow edge is greatly improved, and the softening of the illumination is a feature well worth consideration.



TRANSLATION.

ON THE TREATMENT OF EXTREME VARIETIES OF BLEPHARITIS-ECTROPION.*

BY

PROFESSOR HERMANN KUHNT,

BONN, GERMANY.

THE eversions of the lid caused by chronic inflammation of the lid edges are very difficult to remedy. Yet the discomfort of the condition and its tendency to become aggravated render its cure essential. The pustule formation in the cilia follicles, which has probably persisted for years, leads to the formation of much cicatricial tissue and to definite changes in the skin of the whole lid, changes in the direction of general thickening and shortening of

*Abridged translation from *Zeitschrift für Augenheilkunde*, August, 1908.

the skin. At the same time the cilia become distorted, and are often directed towards the globe. The following conditions have to be altered by any therapeutic measures undertaken.—First and most important is the rotation of the lid outwards caused by scar tissue and the shrinking of the skin.—Secondly, the false position of the lashes, which would irritate the eye, were the lid placed in its normal position. Thirdly, the stretching caused by the ectropion has almost always lengthened the margin of the lid, and caused extreme atrophy of the orbicularis muscle. It is therefore insufficient to lift the lid up and place it in its correct situation, for, as the muscular action of the marginal portion is absent, it would easily return to its false position. The lid must be so firmly fixed in its new place that even severe mechanical traumata cannot displace it. Finally, means must be taken to cure the lagophthalmos which is so often present. It is self-evident that the pustular blepharitis must be greatly ameliorated before any operation is undertaken, and any lacrymal trouble must also be treated.

It is a mistake to suppose that any one operation is suitable for all cases: the degree of ectropion must be a guide as to whether a limited or an extensive procedure be adopted.

The following operation, successfully adopted in 16 cases, appears to be very suitable for extreme examples of the disease. It consists, first, in splitting the lower lid into two flaps, an anterior or skin flap, and a posterior or tarso-mucous

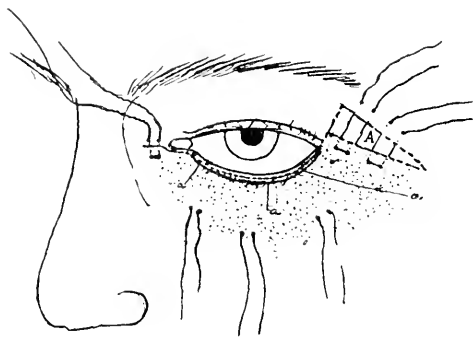


Fig. 1.

membrane flap; and, secondly, in the complete sliding of one over the other, in the sense that the former is lifted and the latter depressed. The operation is performed as follows, under local anaesthesia obtained by the subcutaneous and subconjunctival injection of cocaine and adrenalin:—

Stage 1.—The lower lid is stretched in my (Kuhnt's) lid clamp (an ordinary Snellen's clamp inserted *backwards* acts perfectly for holding either the upper or lower lid while it is split for this and other operations and it is then split just *in front of the cilia* (see Fig. 1 A), or, if madarosis be present, at the anterior lid margin. The follicles of any cilia which remain in the skin flap must now be carefully dissected out, the greatest care being taken to save the skin as much as possible. Flare's intermarginal section must now be made 1 mm. behind the first split (see the dotted line in Fig. 1) from the punctum

lacrymale to the external commissure. This incision must be deepened, and the whole of the roots of the lashes excised.

Stage 2.—The split must be prolonged at each end to allow of the requisite sliding and to permit it to be deepened down to the bony edge of



Fig. 2.



Fig. 3.

the orbit. The nasal prolongation demands skill and great care. The lid must be well stretched towards the temple, to define the internal tarsal ligament and its branch to the tarsus. The split is prolonged upon the ligament from the punctum to the crista lacrymalis, and dissected



Fig. 4.

outwards for about 1.0 cm.—1.5 cm. With ordinary care, the lacrymal canaliculi will be avoided. The temporal prolongation of the split is made directly upwards for 1 cm.—1.5 cm. and then bends at a right angle outwards and downwards for 3 cm. (*see* Fig. 1). It is now a simple matter

If the skin flap is drawn tight, to deepen the split to the orbital margin (fig. 1), wounding the fascia tarso-orbicularis (fig. 1, the shaded area).

(fig. 3). The tarso-conjunctival flap must now be divided outwards with scissors up to the orbital margin, just as in von Ammon's canthoplasty.

(fig. 4). The inner flap is depressed by passing 3-5 double-armed sutures through the cul-de-sac and bringing them out through the skin as shewn in the figure. The most nasal suture is placed 2 mm. below and outside the puncture in the apex of the tarsus and then passed well down through the nasal aspect of the skin flap.

To lift the temporal side of the skin flap, I remove a wedge-shaped piece of skin (Fig. 1, A) about 1 cm. to 1.5 cm. broad along its base, and then lift the flap with double-armed sutures placed 3-4 mm. from the skin edges. The edges themselves are united with fine auxiliary sutures. It is thus almost impossible for the stitches to cut out.

The nasal end is lifted by passing a double-armed suture through the lower flap through the middle of the internal palpebral ligament and out through the skin above the incision. When these sutures have all been tied, and the outer flap lifted, then the sutures which depress the inner flap are tied, and the operation is complete.

The swelling of the tissues after the operation is not of serious importance, and, apart from infection, disappears in a few days. Any granulations can be scraped away with a sharp spoon, a proceeding which may have to be repeated.

Kuhnt then gives his reasons for making the first incision in front of the lashes, and describes two of his cases, which are illustrated by photographs. Fig. 2 shews the first case before operation; Fig. 3 soon after; and Fig. 4 the final result.

He often tattoos the skin some weeks after the operation to give the appearance of lashes.

He points out that such extreme cases should be prevented by suitable treatment. He now, in cases where pustulous eruptions round the lashes continue after perhaps years of treatment, removes the cilia-bearing layer entirely, and so brings the disease to an end. The blepharitis itself ultimately produces madarosis, so nothing is lost by removing the cilia by operation.

T. HARRISON BUTLER.

CURRENT LITERATURE.

NOTE. Communications of which the titles only are given either contain nothing new or else do not lend themselves to abstract.

I.—OPTICS.

1. Straub, M. — The formulæ expressing the condition of refraction and the optical adjustment of the eye. *Ophthalmic Review*, April, 1907.
2. Lomb, H. C. Refraction at toric surfaces. *Arch. fur. Augenheil-kunde*, April, 1907.

- (3) **Burdon-Cooper, J.**—Simple notes on oblique prisms. *Ophthalmic Review*, March, 1908.
- (4) **Tooke, Fred J.**—On the use of lenses specially adapted for the estimation of bifocal vision. *Montreal Medical Journal*, August, 1908.
- (5) **Alexander, G. F.**—The correlation of conjugate to principal foci in lenses. *Ophthalmic Review*, August, 1908.

(1) **Straub** (Amsterdam) points out that it is not correct to speak of a myopic eye, say, of 4 D., as being -4 D. This refers to the glass which corrects it, and such an eye should be spoken of as $+4$ D. As emmetropia is the ideal refraction, a myopic eye of 4 D. should be described by the formula $E + 4$ D., and for a hypermetropic eye of a similar amount $E - 4$ D., and so on. One can only hope considering the universal way of expressing the refraction of the eye, that few, if any, will adopt Straub's suggestion, although it may be the more correct method. C. DEVEREUX MARSHALL.

(2) **Lomb** discusses some points concerning the laws of refraction that apply to toric surfaces. The paper is in the nature of a preliminary note and is short; a more detailed discussion of the subject is promised in a future paper. P. J. HAY.

(3) This is a mathematical paper by **Burdon-Cooper** (Bath) to determine the following points: (1) Horizontal and vertical components of an oblique prism; (2) the numerical value in degrees of any prism placed obliquely in the trial frame; (3) the simultaneous correction of horizontal and vertical deviations by a single prism. The paper is one which it is impossible to abstract, and it should be read in full by those interested in this subject. C. DEVEREUX MARSHALL.

(4) Under the above cryptic title, **Tooke** (Montreal) describes a special lens, consisting of a wafer of $+1$ D., $+2$ D., or $+3$ D. cemented to a plane glass corresponding in size to the trial case lenses, by means of which he is able to show to his patient the kind of effect on vision produced by bifocal spectacles. The idea seems distinctly good.* ERNEST THOMSON.

(5) **Alexander's** short mathematical paper does not lend itself to abstract. C. DEVEREUX MARSHALL.

II.—ACCOMMODATION AND ITS ANOMALIES.

- (1) **Blok, D. J.**—Abnormal accommodation in advanced age. (Abnormale accommodatie op hoogen leeftijd.) *Neder. Tijdschrift voor Geneeskunde*, 1904, 11, No. 11.
- (2) **Blanch.**—Astigmatic accommodation. (Acomodacion astigmica.) *Arch. de Ophthalmologia*, August, 1906.

*Nevertheless, the idea has been forestalled by Stewart (*Optic Optic Review*, July, 1908), whose trial-case contains, among other items, three pairs of bifocals (± 1 , 2, and 3) cemented to plane glass. A similar idea has been carried out by E. B. Meyrowitz (*Bulletin*, No. 35, December, 1908), who has fitted up an adjustable trial-frame with two small cells pivoted so that they can be swung out of the way while the distant correction is being tried, and replaced when the effects of bifocal lenses are being explained and demonstrated to the patient. The small cells, of course, are attached to the lower part of the ordinary cell of the trial-frame. L. D. COE.

Königshofer. — Spasm of accommodation. (Akkommodations-Krampf. *Die Ophthalm. Klinik*, 1906, Nos. 23 and 24, and 1907, Nos. 1-4.

- 4) Marri, E.—The relation between the relative and absolute amplitude of accommodation (A' and A'') and the perception of depth in one-eyed people. *Annali di Ottalmologia*, 1907, fasc. 9 to 11.
- (5) Fejér, Julius.—A clinical contribution on ophthalmoplegia interna. (Beiträge zum Krankheitsbilde der Ophthalmoplegia interna.) *Arch. f. Augenheilk.*, Mai, 1907.
- (6) Weidlich, Johann.—A contribution on the relations existing between the size of the pupil, accommodation, and the distance of the object; with general remarks on accommodation. Ueber quantitative Beziehungen zwischen den Pupillenweiten, den Accommodationsleistungen und den Gegenstandsweiten nebst allgemeinen Bemerkungen zur Accommodationslehre.) *Arch. f. Augenheilk.*, Mai, 1907.
- 7 FÉVRIER. — Incomplete palsies of accommodation, of both external recti, and of the orbicularis palpebrarum on the right side, of diphtheritic origin. *La Clinique Ophthalmologique*, 25 septembre, 1907.

(1) Blok gives three cases of an accommodative power not corresponding to the patient's age.

1. Woman, 62 years—

Visus right eye : with +5 D. = 5/6

Visus left eye : with 3 D. = 5/10

With +3 before both eyes reads the smallest print at 20 c.m. Accommodation : 5 diopters, the diameter of the pupil being $3\frac{1}{3}$ m.m.

2. Man, 73 years—

Visus right eye : with +1.5 D. = 5/5

Visus left eye : with +1.5 D. = 5/5

Reads the smallest print with +3.5 at 15 c.m.; pupils $3\frac{1}{2}$ m.m. in diameter.

Accommodation : $0.5 + 1.5 = 3.5 = 4.5$ D.

3. The author himself, 45 years old, having hypermetropic astigmatism of 0.75 D., max. 15" nasal, on both eyes, can boast of $5\frac{1}{2}$ D. of accommodation.

G. F. ROCHAT.

2. Blanco gives notes of case in which there appeared to be a power of correcting astigmatism equal to 2.0 D. cyl. in the left eye, and 1.25 D. in the right.

HAROLD GRIMSDALE.

3. Königshofer discusses the question whether "spasm of accommodation" exists or not, and favours the view that it does. The paper is to all intents and purposes a reply to Hirschberg and Hess. What the author calls "spasm of accommodation" Hirschberg has never seen, and Hess does not call it a "spasm." A review is given of the cases of this kind, or supposed to be of this kind, which have been observed by various authorities, and this is followed by particulars of a number of cases seen by the author, which, he believes, furnish incontestable evidence in support of his arguments.

PERCIVAL J. HAY.

1. The work of Marri (Turin) which is backed by synoptical tables of experiments on 20 one-eyed and eight normal individuals, may be summarized in the following conclusions :—1) In the one-eyed, the relative amplitude of accommodation is, in the period immediately following the loss of one eye, below normal as compared with that in normal subjects. 2) After a time, the relative amplitude increases until it equals or exceeds that of normal

emmetropes. Still later it tends to be equal to the absolute amplitude ($A^1 = A^2$). (3) In the period immediately after loss of an eye, the sense of depth shows a greater diminution than that presented by normal subjects examined with one eye only in use. This diminution is relatively greater than that of the relative amplitude of accommodation in the same subject when he loses one eye. (4) In the one-eyed the sense of depth becomes perfected through time, in a continuous and progressive manner, notwithstanding what has been stated to the contrary by other observers. This fact is most often in direct relation with the gradual increase of the relative amplitude of accommodation.

A. ANTONELLI.

(5) **Fejer** (Buda-Pest) gives particulars of seven cases of ophthalmoplegia interna. Four of the patients had had syphilis, one denied having suffered from any specific infection, one had had a miscarriage, and one, a child, a blow on the head. The last and one of the first cases recovered completely. The others regained their power of accommodation to a large extent, but the size of the pupil remained the same, and the pupil continued to react very slowly to light.

PERCIVAL J. HAY.

(6) **Weidlich** supports the view that the circular fibres and the longitudinal fibres of the ciliary muscle are antagonistic in their action; that in looking from a near object to a distant one, we do not merely relax the circular fibres, but actively engage the longitudinal ones. Both parts accordingly act throughout the whole range of accommodation, from the near-point to the far-point, and from the far-point to the near-point. At a certain distance from the eye there is equilibrium between the two sets of fibres. In this way the range of accommodation is divided into two parts—one in which the action of the circular fibres predominates, and the other in which the action of the longitudinal fibres predominates. The author leads up to the discussion of these matters from a consideration of the size of the pupil for varying distances of the object. This, he shows, cannot be proportionate to the distance, but must be relatively smaller for greater distances. The argument is developed upon mathematical lines. The result is explained by the antagonistic action of the sphincter and dilator pupillæ.

PERCIVAL J. HAY.

(7) **Février** details at great length the case of a patient who, one month after faucial diphtheria of mild type, developed, in succession, paralysis of the soft palate, double-sided paresis of accommodation, paralysis of one orbicularis, paralysis of both external recti, and paresis of some muscles of the lower limbs. The symptoms disappeared in two-and-a-half months, the palate being the last to recover.

ERNEST THOMSON.

III.—SPECTACLES.

(1) **Sulzer**.—The origins of the prejudice against spectacles. (*Les origines du préjugé contre les lunettes.*) *Ann. d'Oculistique*, T. CXXXIV, p. 32, juillet, 1905.

(2) **Bourgeois**.—The early form of spectacles. (*Forme primitive des lunettes.*) *La Clinique Ophthalmologique*, 10 novembre, 1906.

(3) **Sulzer** (Paris) considers that the prejudice against wearing glasses, which he appears to find very strong, is largely a relic of mistaken advice given by former generations of medical men.

R. J. COLLIER.

2. This interesting article by Bourgeois (Reims) does not lend itself to abridgement. It is too full of facts for such treatment and should be read in the original. It may be noted that present-day motor goggles are but a revision to the early "preservative spectacles," or "preserves." It is interesting to observe that this word "preserves" is in common use to-day—at any rate, in Scotland—although it is somewhat loosely applied, and generally means glasses for presbyopia.

ERNEST THOMSON.

IV.—REFRACTION AND ITS ANOMALIES.

1. Minor, J. L.—Examination of the eyes of the pupils in the public schools of Memphis.
- (2) Gonzales, José de Jesus.—Two cases of aphasia complicating ophthalmic migraine caused by errors in refraction. *Annales de Ophthalmologie*, July, 1905.
- (3) Ascunce.—Congestion of the papilla and asthenopia. *Arch. de Oftal. Hisp.-Americana*, August, 1906.
4. Furst, C. M.—On the relationship between the shape of the face and of the orbits. *Zeitschrift für Augenheilkunde*, August, 1906.
5. Posey, William C., and McKenzie, R. Tait.—Results of the examination of students' eyes in the department of physical education, University of Pennsylvania. *Journ. American Medical Association*, March 22, 1907.
6. Koster, Gzn. W. On some peculiar phenomena in retinoscopy. *Ned. Tijdschrift voor Geneeskunde*, 1907, No. 14.
- (7) Ramos.—Ametropia in relation to hygiene of the eye. *Annales de Ophthalmologie*, March, 1907.
- (8) Verdereau. The universal notation of astigmatism. *Archiv. de Oftal. Hisp.-Americana*, July, 1907.
- (9) Pascheff.—An easy method of studying hypermetropic pathological conditions of the fundus oculi. *L'Ophthalmologie Provinciale*, septembre, 1907.
- (10) Kollner, H.—On the influence of ametropia on the recognition of colour, with especial reference to the faculty of comparing spectral colours. Ueber den Einfluss der Refractions anomalien auf die Farbenwahrnehmung, besonders auf die Beurteilung spektraler Gleichungen. *Zeitschrift für Augenheilkunde*, November, 1907.
- (11) Wentink, L. Contribution to our knowledge of myopia. *Thesis for the Degree of M.D.*, Amsterdam, 1908.
- (12) Cornell, Walter S. The prevalence of eye-strain in school children. *Monthly Bulletin of Practice Medicine*, March 22nd, 1908.
- (13) Ash, F.—Further remarks on the myopia question. (Noch einige Bemerkungen zur Myopiafrage. *Zeitschrift f. Augenheilkunde*, März, 1908.

- (12) O'Malley, Austin.—Some neuroses from refractive errors. *American Medicine*, April, 1908.
- (13) Howe, Lucien.—Measurement of the degree of heterotropia. *American Journ. of Ophthalmology*, April, 1908.
- (13A) Stock, W.—On cavernous atrophy of the optic nerve in myopia. (Ueber Kavernöse Sehnerven-atrophie bei Myopie.) *Klin. Monatsbl. f. Augenheilkunde*, April, 1908.
- (14) Shannon, John R.—Errors of the refraction and balance of the eyes and their bearing upon the general health. *American Medicine*, May, 1908.
- (15) Leach, W. J.—Eye strain. *American Practitioner and News*, May, 1908.
- (16) Newmayer, S. W.—Defective vision and the mentally subnormal child. *New York Medical Journal*, May 9th, 1908.
- (16A) Gonzalez.—New observations of ametropia following spring catarrh. Nuevas observaciones de ametropia consecutiva à la periquerato-conjunctivitis exuberante.) *Anales de Oftalmologia*, Mayo, 1908.
- (17) Reik, H. O.—Eye-strain as a cause of headache. *Old Dominion Journ. Med. and Surgery*, August, 1908.
- (18) Ridder, de.—Ocular inspection in the Schools of Brussels. *Annales d'Oculistique*, juillet, 1908.
- (19) Steiger, A.—On the relationship between myopia and astigmatism. *Zeitschrift für Augenheilkunde*, August, 1908.
- (20) Savage, G. H.—Headaches: their relation to the refractive and muscular condition of the eye. *Memphis Medical Monthly*, August, 1908.

(1) An interesting observation, showing the effect of general hygiene upon the eyes, was brought out in Minor's studies, in the following manner:—"In my report to the school board I called attention to the fact that practically the same percentage of myopia was found in all but one of the white schools that I had visited, that in this there was such an increase as to suggest some special cause, and, asked if such could be vouchsafed. With some astonishment that the question was made to appear in this guise, I was told that it was the oldest and most out-of-date building in the city, which was overcrowded, badly ventilated, and poorly lighted.

C. A. O.

(2) Gonzalez (Leon, Mexico) describes two cases of astigmatism, in which the persons affected, after prolonged eye-strain, had ophthalmic migraine complicated with aphasia. Neither of them had been previously nervous; both enjoyed perfect health. The optical correction of the astigmatism was enough to make the headache disappear, and cure has now lasted for years.

HAROLD GRIMSDALE.

(3) This paper is a reply to that of Castresana which was noted some time ago from this journal. **Ascunce** comes to the following conclusions: that the so-called idiopathic congestions of the retina possess no character by which they can be separated from the retinal hyperæmia which is a constant accompaniment of asthenopia; that the means of diagnosis, small differences of visual acuity, are inadmissible as diagnostic signs; that the

and so changes in the static refraction cannot be explained by alterations in the length of the optical axis, as a result of swelling of the retina; but are, in all probability, changes associated with variations in accommodation. Finally, that this hyperemia is a sign of the functional over-activity of the eye, one more symptom of asthenopia, and demands for treatment nothing else than suffices for the relief of these visual disturbances.

HAROLD GRIMSDALE.

(4) **Furst**, in connection with the work of Ask on the relationship of myopia to the shape of the orbit, has investigated the relationship between the shape of the face and the shape of the orbit, and comes to the conclusion that there is a definite relationship, namely: that long faces show a distinct tendency to possess round orbits, that is to say, of a relatively high vertical diameter, while round or broad faces tend to possess oval orbits the long axis of the anterior opening being horizontal, or, in other words, a short vertical diameter.

A. LEVY.

(5) Eight hundred and eighty-three students were examined by **Posey** (Philadelphia) and **McKenzie** (Philadelphia). Of these, 640 were in the college department, 108 in the medical, 81 in the dental, 51 in the law department, and 3 were in the veterinary department. Of this total, 14.70 per cent. were noted as being myopic, while the remaining 85.30 per cent. were either hypermetropic or emmetropic. In the comparison which was made to ascertain the influences of age and study on the refraction, it was found that among 633 students in the two lower classes, 87.25 per cent. were hypermetropic and 12.75 per cent. were myopic, while of 261 students in the upper classes, 80.25 per cent. were hypermetropic and 19.75 per cent. were myopic. Five per cent. more of myopia was found in the professional department in scholars of a similar age than in the college department, this being doubtless accounted for by the fact that most of the scholars in the college come from private or city schools, where the eyes are properly protected; while the scholars in the professional schools come frequently from rural communities, where accurate correction of refraction is impossible and the care of the eyes is neglected. The average age of all the scholars examined was 21.4 years. The statistics showed an increase of about 2.5 per cent. of myopia for each year during the 4 years of college life.

Six hundred and nine of the students examined had full visual acuity in each eye; 94 had full visual acuity in but one eye, while 180 had subnormal vision in both. This last class was labouring under a decided disadvantage in the performance of certain forms of class-room work, irrespective of any possible ill-effects to the eyes from uncorrected strain, while the second class was perceptibly handicapped in the proper use of all scientific instruments.

Three hundred and three students wore glasses; of these 217 were hypermetropic and 86 were myopic. Eighty-seven cases complained of headache, of this number, 47 wore glasses. Of those complaining of headache, 7.50 per cent. had subnormal vision, while the remaining 92.41 per cent. had full visual acuity, and on this account did not suspect that their eyes were at fault.

Of all the students examined, 58 or 6.68 per cent. had spinal curvature or scoliosis, this condition being found 48 times among hypermetropes and 11 times among myopes. Of the total number of students with spinal curvature, the vision of one eye was perceptibly lower than its fellow in 13.79 per cent.; supporting the inference of many ophthalmologists that ocular errors may be responsible in many cases for this abnormality. C.A.O.

(6) The phenomena observed by **Koster** were detected in eyes presenting a considerable difference of refraction in two adjoining spots of the fundus—for

instance, a deep excavation of the disc and its surroundings. If the mirror in practising skiascopy in these eyes is tilted in one direction, the shadow may run in the direction the mirror is tilted, but if the mirror is moved in the other direction the shadow runs opposite. For explanation the original must be consulted.

G. F. ROCHAT.

(7) **Ramos** points out the advantages to the public health of a proper examination of the eyes of school children by a qualified ophthalmologist.

HAROLD GRIMSDALE.

(8) **Verdereau** thinks it desirable that there should be one method of notation for astigmatism, and proposes that the zero should be on the left, and that we should number counter-clockwise to 90° below, and 180° on the right. This method seems to the reviewer to contain two bad points: it neither follows the universal notation of the circle, nor allows the immediate recognition of symmetry, which is the one advantage obtained by forsaking this notation.

HAROLD GRIMSDALE.

(9) **Pascheff** recommends a concave mirror 4 cm. diameter with a focal distance of 5 cm., and a central aperture of 3 mm. diameter for examining pathological conditions in the anterior part of the vitreous, such as detached retina or exudations. He claims that it gives more light than the ordinary ophthalmoscopic mirror, and allows the observer to get close to the eye and to look directly into its interior.

R. J. COULTER.

(9A) **Köllner** thought that it was necessary to know whether ametropia was responsible for the uncertainty which certain persons showed in matching colours, comparing spectra, and appreciating tints at the far end of the spectrum. Until the influence of errors of refraction had been investigated, it was impossible to determine how far abnormalities in the colour perception mechanism were accountable for the observed errors, and how far they were merely the result of diminished visual acuity. Köllner satisfied himself that the influence of lack of sharpness of the image was quite negligible in comparison with the real cause: a disordered colour sense. Köllner experimented with an artificial myopia obtained by wearing convex lenses.

The experiments, which were made with Nagel's anomaloscope, fell under three heads: a homogenous monochromatic spectral colour was matched with a binary combination. This was done at each end of the spectrum; for example, sodium light was matched with a mixture of lithium and thallium light (Rayleigh's test). Rays of short wave length are not very suitable, because of the lack of brightness at this end of the spectrum. Then the intensity of two primary colours was compared, the whole length of the spectrum being used. Lastly, single primary colours are exhibited and must be named correctly, and a shortening of the spectrum looked for.

The result, as stated, was that up to 20 D. ametropia had no definite influence in causing colour-blindness.

T. HARRISON BUTLER.

(10) **Wentink**, from the examination of many school children, concludes that there are some factors favouring the development of myopia in eyes that are already predestined to acquire myopic refraction. He found these factors to be: 1. macula corneæ, 2. astigmatism, 3. congenital cataract. Wentink speaks favourably of complete correction, the advantages of the latter being: a generally preventive influence on the progression of the myopia, the improvement of the visual acuity, and less deficiency of the action of the recti interni. He prefers complete correction in all cases, no matter if vision be poor or not. The principal contra-indications against full correction are a bad power of accommodation, and an invincible idiosyncrasy of the patient to strong glasses.

G. F. ROCHAT.

(11A) **Ash's** paper is a polemic between the author and Hamburger who

appear to differ in their explanation of the fact that myopia in Sweden has diminished in frequency in the last 10 to 20 years to the extent of 20 per cent. Neither Hamburger nor Ash appears to offer any adequate solution of the problem.

T. HARRISON BUTLER.

(3A) A type of optic atrophy considered to be characteristic of glaucoma (Schnabel) had been observed once before in a case of excessive myopia (see abstract of Pollatti's paper in THE OPHTHALMOSCOPE, 1906, p. 638.) **Stock**, in continuation of these researches, examined microscopically a series of highly myopic eyes and met with the same condition in five instances. He therefore concludes that the occurrence of cavities in the optic nerve is common to both glaucoma and high myopia. By way of explaining this remarkable type of atrophy, he considers that the cavities are caused by the tearing of nerve-fibres as a result of increased intra-ocular pressure in glaucoma and of distention of the globe in myopia.

C. MARKUS.

16A. In four of the five cases recorded, there was no affection of the cornea, it cannot therefore be said that the ametropia was due to cicatricial contraction. **Gonzalez** thinks that the deformity is due to pressure of the fingers on the lids to relieve the constant irritation.

HAROLD GRIMSDALE.

18. **de Ridder** gives the results of the examination of the refraction of school children in Brussels during the year 1906-7. These show that the percentage of myopia increased from 5.5 at the age 6-8 years to 18 at the age of 13-14, thus confirming previous observations.

R. J. COULTER.

19) **Steiger** (Zurich) tries to trace a causal relationship between myopia and astigmatism, but his arguments are far from convincing. He points out that astigmatism with the rule is a congenital condition found in a large number of children and adolescents. When we examine older individuals we find that astigmatism against the rule becomes relatively much more frequent. This form of astigmatism is essentially a characteristic of age. The change the author finds, from his measurements with the ophthalmometer, to be entirely due to alterations in the cornea. **Steiger** has examined a large number of school children in both the lowest and the highest forms. Myopia is naturally more common among the older children, but he also discovers that astigmatism against the rule is more frequent among the myopes than among children who are not myopic of the same age. He has no doubt that inverse astigmatism is more common among myopes than in young emmetropes or hypermetropes. Inverse astigmatism is extraordinarily common in glaucoma, and **Eissen** has shown by experiment that the first result of high tension is to reduce astigmatism with the rule, then to obliterate it, and, finally, to produce astigmatism against the rule. We can therefore suppose that inverse astigmatism is often caused by increased tension. The same increased tension may give rise to myopia. Inverse astigmatism in emmetropes and hypermetropes may be due to chronic high tension, the pathological process being comparable to that which gives rise to conical cornea. Inverse astigmatism must not be considered as caused by myopia, the two are associated phenomena and have the same cause. As the myopia increases, the inverse astigmatism increases *pari passu*. This latter view is certainly open to criticism, for it is quite common to find very high myopia without astigmatism, or even with astigmatism with the rule.

T. HARRISON BUTLER.

V.—PATHOLOGICAL TECHNIQUE.

- (1) **Pollock, W. B. Inglis.**—The advantages of paraffin as an embedding material in eye pathology. *Ophthalmic Review*, September, 1908.
- (2) **Verhoeff, F. H. and Fisher, Carl.**—An improved method of bleaching pigmented tissues. *Archives of Ophthalmology*, September, 1908.

(1) This communication is essentially a practical one which describes in detail the method employed by **Pollock** (Glasgow) for cutting sections of the eyeball, as a whole or in part. Many workers have advocated the advantages of embedding in celloidin, but **Pollock** finds that he can obtain thinner and more satisfactory sections when the object to be cut is embedded in paraffin. For details, readers are referred to the original communication.

C. DEVEREUX MARSHALL.

(2) **Verhoeff** (Boston) and **Fisher** (Boston) find that Alfieri's method of bleaching pigmented tissues, such as the pars iridica retinae, is tedious and apt to be imperfect as regards its results. Accordingly, they have modified the original method by greatly increasing the strength of the permanganate and oxalic acid employed in the process. The modified solutions, contrary to expectation, do not render sections more brittle. For success it is of consequence to have sections thoroughly embedded in celloidin; paraffin sections will not remain on the slide. Details follow: sections are placed for twenty minutes in a saturated watery solution of potassium permanganate (1·16), washed, and transferred to a saturated aqueous solution of oxalic acid (5 per cent.) for about 5 minutes; and, finally, the specimen is washed and stained. The best results are obtained after fixation in Zenker's fluid or formalin. Bleached sections take various stains uniformly. Tubercle bacilli stain by the Ziehl-Neelsen method more intensely than in non-bleached sections, and Gram-positive bacteria take the Gram-Weigert stain in bleached sections. As blood pigment and the usual extraneous pigments do not bleach by **Verhoeff** and **Fisher's** method, the latter forms a simple means of differentiating them from the autochthonous pigments.

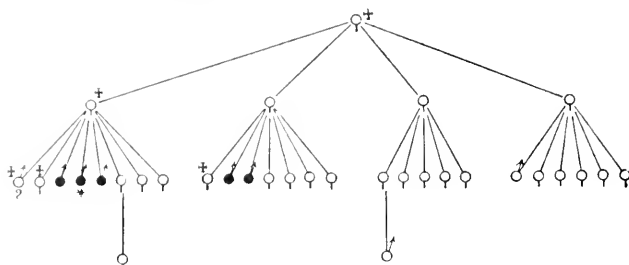
SYDNEY STEPHENSON.

VI.—HEREDITARY NYSTAGMUS.

Caspar, L.—A case of hereditary nystagmus. (Ein Fall von vererbtem Augenzittern.) *Centralbl. f. prak. Augenheilk.*, Juli, 1908.

Caspar (Mülheim) gives an interesting genealogical tree—which was drawn up after he had seen a male patient, aged 31 years, who had always had nystagmus and weak sight. The nystagmus took the form of slow, jerking, horizontal movements, with quicker movements on looking to one or other side. There was a high degree of astigmatism, 7D. R. and 3·5D. L. Ophthalmoscopically, the disc was normal, but at the periphery there was a great lack of choroidal pigment. Two brothers and two maternal cousins suffered from the same trouble. Both parents healthy. The family history was as follows.—His mother had no brothers—her own mother had good sight, but about her family nothing could be

discovered. The mother of our patient had had eight children. The first, a son, and the second, a daughter, died early. Then followed three sons, who were all affected, and of whom the patient (marked in the tree with a +) is the middle one, then three healthy daughters. The history of the mother's sisters can be seen from the tree. It is, therefore, a



case of an affection transmitted to males, almost all of whom are affected, through healthy females. The other point is the great preponderance of female children, except in the case of the first-born, who is usually a male. Hereditary syphilis probably plays some part in this family. A. LEVY.

VII.—THE SURGICAL TREATMENT OF OPTIC PAPILLITIS.

Stieren, Edward. Surgical interference in choked disc. *Ophthalmic Record*, March, 1908.

Stieren (Pittsburg) summarises the views of Horsley, Gunn, and Paton, with regard to the effect produced upon optic papillitis by lowering intracranial tension surgically. He narrates a case believed to be one of cerebellar tumour, where, under purely medical measures, the sight of one eye was reduced to 6/200, and of the other to 6/15, in consequence of optic atrophy. He raises the question how long medicinal treatment should be continued before surgical measures are decided on. Horsley is quoted as proposing a probationary period of from six to eight weeks, and Starr one of three months. On the other hand, Barrett holds that unless there be some special contra-indication, all non-syphilitic cases of optic neuritis should be trephined as early as possible. Stieren himself favours opening the skull and dura mater as soon as the diagnosis of increased intracranial pressure is established, and believes that medical treatment may, if necessary, be commenced after surgical operation. In estimating the amount of sight that may be obtained by operation, much depends upon the ophthalmoscopic appearances before surgical means have been adopted. Prognosis is not, as a rule, good if signs of degeneration of the retina, especially in the region of the macula, are present. Oedema of the nerve, moderate oedema of the retina with small hemorrhages, exudations along the course of the vessels, and even larger exudations, provided they are not in close proximity to the macula, do not necessarily warrant a bad prognosis as regards sight, since it has been shown that these lesions may disappear after the retinal circulation has been

re-established by surgical procedures. Stieren's own experiences with measures other than operative for the relief of choked disc have been discouraging.

Stieren cites the following three cases as showing the good effects that may follow surgical interference :—

Case No. 1.—A man, aged 30 years of age, contracted syphilis nineteen years before coming under notice, and two years after that sustained an injury to the right frontal bone. History of convulsions, latterly occurring every two or three weeks. On examination, depressed scar, about two inches long, over the right frontal region. Constant frontal headache. Marked double optic papillitis. Ascending doses of potassium iodide and mercurialunctions brought about no improvement in the symptoms. After two months of this treatment, craniectomy performed, including the depressed cicatrix over the frontal bone. A cyst, which contained about two ounces of fluid, was found to lie between the meninges immediately beneath the depression in the skull. Headache ceased promptly and completely, and in a fortnight the papillitis had subsided. The attacks of Jacksonian epilepsy, however, continued until the patient left the hospital, on his own responsibility, six weeks after operation.

Case No. 2. This was a sarcoma of the superior parietal convolution, producing Jacksonian epilepsy, choked disc, and right oculo-motor paralysis. During operation, alarming hemorrhage from longitudinal sinus, which necessitated prompt packing of the cerebral cavity in order to prevent death upon the operating table. Incomplete removal of tumour, however, followed by prompt subsidence of oculo-motor paralysis and choked disc, preservation of useful sight, and a marked improvement both in the mental and physical state of the patient, who survived for more than two years.

Case No. 3. A man of 38 years, complained of a disorder of the sense of smell, accompanied by some mental confusion, and occurring at intervals. After lasting for some twenty-two months, these symptoms became complicated with frontal and occipital headache, dulness of perception, and failure of memory. Stereognostic appreciation normal. Knee-jerks equal. On percussion, right side of forehead more tender than the left side. Paralysis of the right external rectus muscle. Papillitis most marked in the right eye. Sense of smell affected, especially on the right side. *Differential diagnosis.*—Cerebral tumour, probably of the right frontal lobe. The skull was opened over the base of the frontal and part of the parietal lobe, and the meninges were found to be normal. The dura mater was freely opened. Digital exploration failed to disclose any abnormal condition, neither did repeated puncture of the frontal lobe bring to light the existence of any tumour, solid or fluid. The patient made a speedy and uneventful recovery, with a moderate cerebral hernia. The papillitis rapidly subsided, and the action of the right external rectus muscle was fully recovered. Vision reached 6/7, and remained at that point until about a month before the patient's death, which took place three years and four months after the man first fell under Stieren's observation. At the autopsy, a vascular glioma was found to be growing from the right cerebral lobe.

SYDNEY STEPHENSON.

VIII.—GLIOMA.

- (1) Fischer, F.—Gliomatous degeneration of the optic path. (Ueber gliomatöse Entartung der Opticusbahn.) *Arch. f. Augenheilkunde*, Bd. LIX, Heft 2.
- (2) Lukens, Charles.—Glioma retinae, with report of a binocular case cured. *Journal of Ophthalmology and Oto-Laryngology*, January, 1908.
- (3) Schneider, G. J.—Glioma of the retina, enucleation and recovery. *Ophthalmic Record*, August, 1908.
- (4) Gardiner, John Paterson.—Bilateral glioma of the retina with numerous distant metastases. *Archives of Ophthalmology*, November, 1908.

(1) Fischer's case of gliomatous degeneration of the "optic path" occurred in a girl, aged 2 years. The degeneration involved the left optic nerve, the chiasma, the right optic tract, the hypophysis, the recessus opticus of the third ventricle, and a portion of the white substance of the cerebral hemispheres. The author gives a minute description of the

microscopic appearances, with special reference to the characters of the neuroglia cells. The sections show that in gliomas the neuroglia cells may undergo a number of changes which are characterized more particularly by the protoplasm remaining in a more or less indefinite state of differentiation, and by the absence of fully-formed neuroglia fibres. They show, further, that gliomatous growths of the optic nerve may invade and infiltrate the optic sheath. In discussing the literature of the published cases of this kind, the author thinks that in the majority of cases the usual diagnosis of myxosarcoma is not well-founded. The tumours should be examined with selective stains for neuroglia, and then one would probably find that the neuroglia is more frequently the substratum of a new growth of the optic nerve than is generally supposed. PERCIVAL J. HAY.

(2) **Lukens** (Toledo, Ohio) removed the eye of a child, aged 9 months, on account of glioma, confirmed pathologically. About $2\frac{1}{2}$ years afterwards, the other eye was found to be affected, and was enucleated shortly after. Pathological examination confirmed the gliomatous nature of the growth. When last heard of, upwards of four years after the first operation, the child was reported to be in good health. It is interesting to note that a first cousin of Lukens' patient succumbed to a recurrence after removal of the eye for glioma. The author has seen seven cases of glioma, of which six were operated on. Five were in the extra-ocular stage. He strongly holds that the disease is curable if the eye be operated on before the growth has passed the confines of the eyeball; but even then operation should not be denied, since it offers the only chance of cure and may save weeks of suffering. It is, of course, impossible to determine this point before operation, although the appearance of inflammatory symptoms furnishes a strong presumption that extension beyond the eyeball has already taken place. Lukens agrees with Hirschberg in believing that the prognosis of glioma is good provided operation be performed within ten weeks of the first appearance of the whitish appearance from the interior of the eyeball. When in doubt as to diagnosis, operation is usually conservative surgery. SYDNEY STEPHENSON.

(3) **Schneider** (Elgin, Ill.) removed the eye of a child, $2\frac{1}{2}$ years, on account of glioma. Upwards of six years later, the child remained in good health. No mention of any pathological examination of the enucleated eyeball.

SYDNEY STEPHENSON.

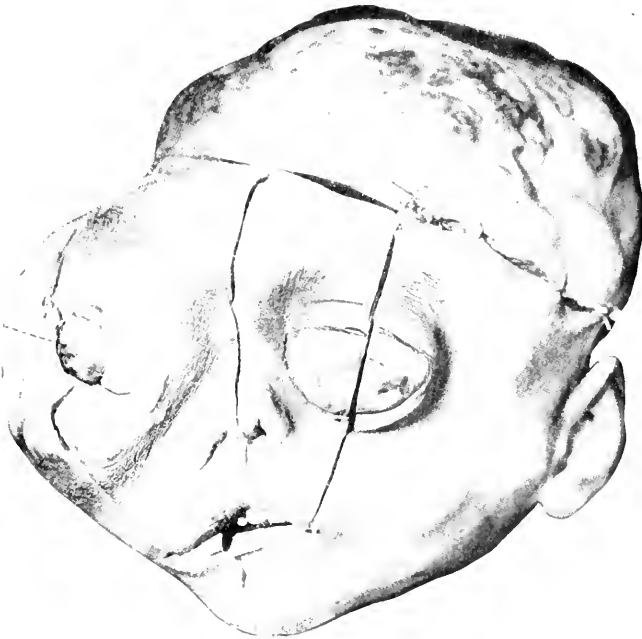
(4) **Gardiner's** communication resolves itself into an elaborate account of the *post-mortem* and pathological examination of a child, aged $4\frac{1}{2}$ years, who died from glioma retinae with numerous metastases. His interesting observations may be epitomized (very imperfectly) as follows:—

The face presented two growths—the larger on the right side including the orbit had the side of a large grape fruit, while the smaller, occupying the left orbit, had about the size of a large English walnut. The two enlargements, one on either side of the face, were connected by a swelling over the glabella. There were several metastatic growths about the skull, which on removing the scalp, were seen to lie beneath the pericranium. The internal surfaces of several cranial bones were affected. There was a correspondence between the location of the growths on the outer and inner surfaces, and where growths were most marked on the outer they were likewise most marked on the inner surface. At no point in the skull-cap, however, was there a complete deficiency in the bone.

Sections of the head and face showed that all the structures on the right side, from the dura above to the hard palate below, were involved. The left side was affected to a less extent. Metastases were found in the lymphatics of the neck and neighbouring parts, pleural cavity, manubrium sterni,

costo-chondral cartilages, vertebrae, bones of the pelvis, and long bones of both legs.

The eyes that had been enucleated during life both contained glioma retinae, which in the case of the right eye, the first to be affected and removed, had extended along the optic nerve. Sections examined microscopically from metastases in various parts of the body showed little analogy with the structures of the primary growths except "a close duplication in



numbers and distribution of blood-vessels and the corresponding relation to aggregations of tumour cells." They were marked by wide blood-vessels, regions of hæmorrhage, unequally distributed capillaries, larger and smaller masses of tumour cells, and often appearances which suggested rapid growth into normal tissue. Gardiner concludes an exhaustive account by saying that "this absence of ordinary growth, and the appearances caused by it, present in nearly all the secondary tumours, is such as might be met with in round-cell sarcomas originating almost anywhere in the body."

SADLEY STEPHENSON.

IX. GENERAL TENOTOMY OF THE RECTI MUSCLES.

Wicherkiewicz. — General tenotomy of the recti muscles of the eye for cosmetic, prophylactic, and functional reasons. (La ténatomie sommaire des muscles droits de l'œil au point du vue, cosmétique, prophylactique, et fonctionnel.) *La Clinique Ophthalmologique*, 10 septembre, 1908.

The title of Wicherkiewicz's article hardly gives one much idea of the object of the procedure of tenotomy of all the recti muscles. It occurred to the author that in a phthisical eye the constant pressure of the recti muscles, which causes the eye to become quadrilateral, must result in pressure on the ciliary nerves and may thus be a factor in the production of sympathetic ophthalmitis. Waiting his opportunity to put his theory to the test, he found a patient who was suffering from sympathetic disease and who refused enucleation of the exciter, which was atrophic, quadrilateral, and painful. As the result of tenotomy of the four recti muscles, the depression of the surface due to their pressure disappeared, and the eye came forward in the orbit. In a few days the pain had gone, and after healing it was found that from the point of view of motility nothing better could be desired. The chronic irido-cyclitis of the sympathiser gradually yielded and the patient left the *Clinique* with V. $\frac{6}{60}$; (before operation V. = fingers at 1 metre). Wicherkiewicz has now performed the operation twelve times, not always on account of sympathetic ophthalmitis — exact details of cases are not given, but in cases generally in which the eye becomes indented by the recti muscles.

To the reviewer the advantages of the operation seem to be divisible into two classes: 1. those which are certain, namely, the relief of pressure, relief of pain, improvement in the appearance owing to the eye coming forward in the orbit; 2. those advantages which require further proof, namely, the removal of excitator influences on the other eye and the prevention of their future occurrence, and the author's claim that he has seen an eye undergoing atrophy not only recover its form, but recover a "more prompt, more exact sensation of light."

So far as the operation may take the place of enucleation Wicherkiewicz merely pleads that it may be given a trial where enucleation is refused.

As to the cosmetic effect alone he acknowledges that de Wecker spoke of it in 1895. *La Clinique Ophthalmologique*, 10 janvier).

ERNEST THOMSON.

X.—ECLIPSE BLINDNESS.

- 1) Casali, A. Amblyopia following sun-gazing. *Annali di Ottalmologia*, Vol. XXXVI, 1907, Fasc. 3-4, pag. 189 to 230.
- 2) Cosmettatos. Serious eye lesions following direct observation of the solar eclipse. Des lésions oculaires graves consécutives à l'observation directe de l'éclipse de soleil. *La Clinique Ophthalmologique*, 25 avril, 1907.

1. After the description of fourteen personal cases, and after giving a complete bibliography, Casali (Florence) thus concludes an interesting article:

"Fixation of the sun's disc, either directly or by reflection from water or otherwise, causes changes of visual function, characterised by slight photophobia, nyctalopia, amblyopia, and positive central scotoma. This scotoma may be absolute or relative for white and for colours or for colours only; and the cases where the scotoma is absolute lead to a more serious diagnosis than those in which the scotoma is relative. The scotoma is probably due in part to spasm of the retinal triad. Often enough there is a slight contraction of the visual field for white and for colours, and a certain amount of accommodative asthenopia. On ophthalmoscopic examination, the most constant sign is a darker and wider colouration of the centre of the macular region than in the normal state; often there is a slight congestion of the disc, œdema of the retina, and venous engorgement; very rarely there is a true serous retinitis; also very rarely there are hæmorrhages of the macula region. Rational treatment consists in absolute rest of the eyes away from any bright light, in the use of quinine and, later on, of strychnine, and in the application of the continuous current."

A. ANTONELLI.

(2) **Cosmettatos** (Athens) relates the case of a woman of 23 years, who, after observing the 1903 eclipse with the right eye, developed optic neuritis. A year later sight was almost abolished, and the nerve found to be completely atrophic. The other eye had full vision. Strychnine injections were of no avail.

ERNEST THOMSON.

XI.—RETINITIS PIGMENTOSA.

Nettleship, E.—On retinitis pigmentosa and allied diseases. *Royal London Ophthalmic Hospital Reports*, Vol. XVII, Parts I, II, and III.

Nettleship's voluminous communication extends to 165 pages and appeared in three parts of the *Reports*, published in March, 1907, January, 1908, and November, 1908.

The diseases discussed in this paper are retinitis pigmentosa including the so-called retinitis pigmentosa sine pigmento, retinitis punctata albescens (Mooren and Gayet), atrophía gyrata choroideæ et retinæ (Fuchs), and congenital stationary night-blindness without changes. Possibly the last-named is not of the same nature as retinitis pigmentosa, but the two conditions are so much alike in their symptoms and natural history that it was thought by the author that they might be considered side by side. The object of the paper was to apprise the share taken by heredity and consanguinity in causing these maladies, and especially to ascertain whether blood-relationship carried any influence at all, apart from the existence of a predisposition to the disease in the two consanguineous parents and ancestors. For this purpose he analysed all the published and unpublished cases, including about one hundred of his own, the result being a series of nearly 1000 families, containing about 1,700 persons affected with retinitis pigmentosa, and upwards of fifty families, containing nearly 300 individuals affected with some one of the other three diseases.

As regards **retinitis pigmentosa**, Nettleship found heredity without consanguinity in 23.5 per cent., of consanguinity without heredity in 23 per cent., and of heredity combined with consanguinity between 3 and 4 per cent. A long list of cases with most elaborate family trees completes the first part of the paper in order to illustrate the various degrees and modes in which heredity and consanguinity affect the question.

The second instalment of the paper is published in Part II of the *Reports*, and is concerned with the consideration of some of the exciting causes of retinitis pigmentosa.

Disease of the blood-vessels may certainly cause the disease, and ophthalmoscopic appearances, similar to those of retinitis pigmentosa, have been seen in cases where the ciliary vessels have been divided.

The questions Nettleship wished to solve were these:—

1. Whether an hereditary tendency to disease of small arteries, say, those of the choroid, may in favourable circumstances remain latent throughout a lifetime?
2. Whether any constitutional conditions can act as exciting causes and evoke the changes leading to retinitis pigmentosa in persons some of whom might otherwise have escaped.

Copious and rapid hemorrhage can induce or stimulate the progress of retinitis pigmentosa, and a case of serious uterine hemorrhage is described to illustrate the fact. In this patient the ocular changes culminated in retinitis pigmentosa, and a similar accident occurring in the daughter caused acute optic neuritis and temporary blindness. Other cases of a similar nature are given.

In some cases retinitis pigmentosa affects one eye alone, and this can only at present be explained by supposing the vital endowments of the choroid are sometimes different in the two eyes, an assumption considered by no means improbable although unproved at the present time.

There is a complete absence in these cases of "anticipation" or the tendency for the disease to manifest itself at an earlier age in each succeeding generation. The night blindness is usually noticed at about the same age in each family. It is at present unknown whether the kind of consanguinity of consanguineous ancestors has any bearing upon the occurrence of the disease in their descendants, and there is a similar scarcity of information as to the age of parents at marriage.

As regards sex, it was found that 62.5 per cent. are males, and 57.5 per cent. are females.

Variations in the clinical characters of the disease are next discussed with illustrative cases.

As regards the seat of the earliest pathological changes, Stock concludes, from microscopical evidence of a case, that the bacillary layer is the first structure to suffer, the choroid and pigment epithelium being affected only in a secondary manner. Lister found, on examining an eye which had been blind from this disease for some years, and which showed an advanced state of retinitis pigmentosa, that the rods and cones were altogether absent, but at the macular region the pigment epithelium still formed a well-marked layer, and in the same region the ganglion cell layer was still well seen, the choroid was atrophied but the choroidal vessels were not thickened.

Some cases are cited in which slight, although characteristic, deposits of pigment may be visible ophthalmoscopically in the inner retinal layers from 3-6 years of age, and probably as early as 15 months, and that the changes may be quite advanced at 7-8 years. The distribution of pigment may be more or less peripheral or equatorial, and may form a complete or broken belt. Marked differences are seen in the size of the individual deposits. Whether the quantity of pigment in the retina has any relation to the complexion of the patient is difficult to decide, but abundant pigmentation is sometimes seen in quite fair people with blue irides and light choroids. The age at which blindness becomes complete is variable, but, with rare exceptions, it occurs after 30-35 years, and more usually about 60 years or later.

Occasionally night-blindness is absent or unnoticed even when the retinal changes are well-marked, while occasionally day-blindness and dislike of bright light, with colour-blindness, is manifest. Ring scotoma is generally present, although it is liable to be overlooked unless carefully sought for. Retinitis pigmentosa with central changes is not very uncommon.

Retinitis pigmentosa sine pigmento usually signifies the initial stage of the disease, although usually some pigment is visible in the outermost layers of the retina.

A few cases have been described where the choroid appeared to be absent, or, at least, could not be seen to exist except over a small area at the yellow spot; there is no record of such a case having been examined microscopically, and possibly the condition is not related to retinitis pigmentosa.

Retinitis punctata albescens is a term which should be restricted to those rare cases in which the fundus is sown evenly with innumerable, discrete, white dots, entirely free from pigment, affecting the central and peripheral parts of the retina. Apparently dating from birth or early life and remaining stationary, the disease is a family one and the parents are often consanguineous, although it has not hitherto been seen in more than one generation. Several illustrative cases are given, with their family trees and a diagrammatic drawing of the appearance of the fundus. Some of these cases have occurred in families the subject of retinitis pigmentosa.

Night-blindness without changes does occur and has been known for years and was, and still is, called "moon-blindness." An extremely common superstition, held strongly by sailors and others, underlies this name; and there is perhaps some truth in this tradition as regards a temporary or endemic form of night-blindness, which occurs under circumstances of combined privation and exposure to light, but there is no proof that exposure to light influences any of the forms of permanent night-blindness. Most of the subjects of stationary night-blindness can see fairly well by lamp-light or by bright moon-light, but on moonless nights or in a darkened room or a cellar they are blind.

The disease in this masterly communication is discussed from every conceivable point of view. The labour attending the examination of these cases and the search for family histories must have been enormous. Nettleship has over and over again proved himself a past-master in this line of investigation, but he has surpassed even himself in the laborious task he has now brought to so successful an issue. An abstract such as the present gives anyone but a very slender idea of the communication which should be studied by all interested in the subject. It will for years remain the standard work on the subject, and might with great advantage form the basis of a monograph on Retinitis Pigmentosa.

C. DEVEREUX MARSHALL.

XII.—BURNS OF THE EYE WITH SODIUM.

Deschamps. — On burns of the eye with sodium. Sur les brûlures de l'œil par le sodium. *Ann. d'Oculistique*, T. CXXXIII, p. 408, décembre, 1907.

Deschamps records the case of two workmen who at different times, in spite of orders to the contrary, washed out with water vessels which had contained

sodium and in which some traces of the metal were left. In each case a jet of complex vapours was caused which sprung up so suddenly as to burn the man's face and eyes before he had time even to close his eyelids.

In the eye which was most severely injured there was complete destruction of the bulbar conjunctiva, leaving exposed sclerotic, which had a peculiar porcelain-like appearance. Apart from a slight haze of the cornea, the rest of the eye was at first practically normal and its vision was almost perfect. The eye, however, rapidly "went to the bad," and at the end of a fortnight, the cornea sloughed away, and the contents of the eye were expelled. The lids ultimately became adherent to the remains of the eyeball, thereby giving rise to complete ankyloblepharon.

The second eye of the same patient had a similar burn, the size of a bean, astride the cornea in its lower and inner quadrant. Vascular cicatricial tissue was formed on the surface of this and the nutrition of the deeper layer of the sclerotic, of the cornea, and of the iris was affected, with the result that three months after the accident there was a leucoma involving about a quarter of the cornea, with atrophy of the corresponding part of the iris, and displacement of the pupil towards the leucoma, although there had never been a perforation of the eyeball. There was also a symblepharon, and vision was reduced to 1/4.

In the other patient the lesions were similar. Neither eye was completely lost, there were opacities and distortion of both corneae, with shrinking of the conjunctiva and limitation of movement, completely disabling the patient from ever again doing any work. In both cases there were superficial burns of the face, without formation of vesicles, which healed rapidly.

The author considers that the vapour which caused the burns consisted of caustic soda at a high temperature, containing perhaps a very small quantity of sodium, and insists on the necessity of giving a guarded prognosis in all cases of burns of the eye by chemicals. He also relates a third case in which a tiny piece of pure sodium lodged in the lower *cul-de-sac* of a workman. This caused a localised deep scar without any implication of the eyeball.

R. J. COULTER.

XIII. OPHTHALMIA NEONATORUM.

- 1 Nance, Willis O. (Chicago, Illinois).—Report of a case of ante-partum purulent conjunctivitis. *Journal of Ophthalmology and Otolaryngology*, April, 1907.
- 2 Fernandez. The prophylaxis of ophthalmia neonatorum. (La profilaxis de la oftalmia neonatorum.) *Archiv. de Oftal. Hisp.-Amer.*, July, 1907.
- 3 Alvarado. The prophylaxis of ophthalmia neonatorum. (La profilaxis de la oftalmia neonatorum.) *Ibidem*.
- 4 Nunn, J. H. F.—Acute arthritis complicating a case of ophthalmia neonatorum. *Lancet*, September 14th, 1907.
- 5 Stevenson, Mark D. Akron, Ohio.—Purulent conjunctivitis in infants and adults. *Medical Fortnightly*, 11th November, 1907.

- 6) Lewis, Frank N.—A case of ophthalmia neonatorum followed by pyæmia and death. *Ophthalmic Record*, January, 1908.
- 7) Lewis.—*Buffalo Medical Journal*, January, 1908, and *Therapeutic Gazette*, April, 1908.
- (8) Wood, H. (Nashville, Tennessee, U.S.A.)—Ophthalmia neonatorum as a sociological problem. *Journal Tennessee State Medical Association*, July, 1908.
- (9) Cullom, M. M. (Nashville, Tennessee, U.S.A.)—Purulent ophthalmia—Pathology and treatment. *Journal Tennessee State Medical Association*, September, 1908.
- (10) Gaupillat.—Purulent conjunctivitis of the new-born. Treatment. Conjonctivite purulente du nouveau-né. Traitement. *La Clinique Ophthalmologique*, 10 septembre, 1908.
- (11) Nance, Willis O.—Some observations on ophthalmia neonatorum. *Journal of Ophthalmology and Oto-Laryngology*, November 1908.
- (12) Mayou, Stephen.—A clinical lecture on ophthalmia neonatorum. *Medical Press and Circular*, December 16th, 1908.
- (13) Hellendall, H.—Results with my new method of using Credé's plan to the eyes of the newly-born in institutions and in the practice of midwives. (Resultate mit meinem neuen Verfahren der Credéisierung der Neugeborenen in der Anstalts- und Hebammenpraxis.) *Mediz. Klinik*, 1908, Nr. 42, 18 Oktober, and *Centralbl. f. prak. Augenheilkunde*, Dezember, 1908, S. 380.

2 and 3) Fernandez and Alvarado recognise the value of Credé's method, and suggest local legislation for its more general adoption.

HAROLD GRIMSDALE.

4) Acute arthritis in ophthalmia neonatorum is a rare complication: Nunn (London) writes as if it were almost unknown. A reference to Sydney Stephenson's *Ophthalmia Neonatorum*, 1907, p. 141, will show that a considerable number of cases has been recorded.

ERNEST THOMSON.

6) Lewis (New York) reports the death of an infant from gonorrhœal pyæmia. The facts are briefly as follows.—Three days after birth both eyes became inflamed, and when admitted on the ninth day of the disease, there was much swelling of the lids of both eyes, together with purulent discharge containing an abundance of gonococci. The corneæ were hazy. The baby was well-nourished, weighing 8lbs. Five days after admission, an abscess over one malleolus was opened, and gonococcal pus evacuated. Other abscesses followed in various parts of the body—as, for example, left elbow, left sterno-clavicular articulation, left knee, each wrist, and left axilla. Gonococci were found in pus from each of these abscesses. The temperature curve was a tolerably characteristic one for pyæmia. The child died three weeks after admission, and when nearly five weeks of age. No *post-mortem* examination could be obtained. It should be added, finally, that both the father and the mother suffered from acute gonorrhœa, and that salpingitis developed in the woman some three weeks after the birth of the baby.

SYDNEY STEPHENSON.

(7) Lewis (New York) gives the following advice as to what should be done to combat this dangerous menace to child and adult life:

1. Secure the enactment of laws in each State or Federal Territory placing

the supervisory control and licensure of midwives with the boards of health ; requiring that these unqualified practitioners be examined and registered in each county and that they be compelled to immediately report each case of ophthalmia occurring in their practice, under penalty, if found guilty, of forfeiture of their licence and a fine.

2. Distribution by health boards of circulars of advice to midwives and mothers giving instruction as to the dangers, method of infection, and prophylaxis of ophthalmia neonatorum.

3. The preparation and distribution by health boards of ampoules or tubes, containing the chosen prophylactic. For midwives, one-per-cent solution of nitrate of silver is almost universally recommended by obstetricians and ophthalmologists. For physicians, the Credé solution should consist of a two-per-cent solution of chemically pure fused nitrate of silver. If used as directed by Credé, one drop from a glass rod one-eighth of an inch in diameter, it is free from excessive irritation and absolutely safe. To insure purity of the drug and accuracy of dosage, the Credé solution should be given freely to physicians who make application therefor. This, however, should be merely advisory. The health department should be free to use such prophylactic as it may deem best.

4. Periodic report to boards of health by all physicians engaged in obstetrics of the number of cases of ophthalmia neonatorum that have occurred in their practice, whether or not a prophylactic was used—and if so, what—together with the result.

5. The accomplishment of these measures by the appointment of committees through the various State and county societies whose co-operation would make concerted action possible.

6. To secure these ends the requested co-operation of the American Association of Obstetricians and Gynecologists, the Academy of Ophthalmology and Oto-Laryngology, the American Ophthalmological Society, the American Public Health Association, and such other organizations as may appoint committees on ophthalmia neonatorum.

If this plan of campaign be agreed upon, with such modifications as obstetricians, ophthalmologists, and sanitarians may suggest, then a united and co-ordinated effort should be made to carry it into effect. If we would protect the babies—future citizens of the United States—from the poverty and misery of needless blindness, we must join hands and form a cordon reaching from Maine to Alaska and from the Great Lakes to the Gulf. The machinery is already in existence. It is but to act!

10. **Gaupillat's** article resolves itself into: first, a plea for the expert treatment of ophthalmia by the oculist, and, secondly, a condemnation of the use of nitrate of silver except by the ophthalmic surgeon.

ERNEST THOMSON.

11. Based upon personal experience, **Nance** (Chicago) is of opinion that nitrate of silver is the remedy *par excellence* upon which to depend in ophthalmia of the new-born. He considers argyrol in 20 per cent. strength solution a valuable adjuvant. He has found that the best method of irrigation of the conjunctival sac is by the direct insertion, if necessary, of a specially-contrived smooth glass tip, through which copious flushings of a solution of permanganate of potassium or boric acid (or even sterile water) are made. He prefers the use of warm applications instead of cold, as their effect, he thinks, is to stimulate the vascular and the lymphatic circulations to such a degree as to induce better leucocytosis. He is a firm believer in the silver prophylaxis method of Credé, and suggests its more general adoption.

CHARLES A. OLIVER.

(12) **Mayou** (London) in 40 cases of ophthalmia neonatorum, found the gonococcus in 57.5 per cent., the staphylococcus in 20 per cent., the Morax-Axenfeld organism in 5 per cent., the colon bacillus in 5 per cent., and the pneumococcus in 2.5 per cent. With the exception of the Klebs-Löffler bacillus and the streptococcus, the gonococcus "is the only organism which often gives rise to destruction of the cornea." The most frequent time at which infection of the infant's eyes takes place is immediately after birth. Mayou does not mention in this connection the influence of the first bath in the passage of infection, although it is a point to which most observers attach considerable importance. The author has seen false membrane on the conjunctiva associated with the gonococcus, the Koch-Weeks' bacillus, the streptococcus, and the Klebs-Löffler bacillus. Mayou appears to regard so-called "dacryocystitis neonatorum" as a complication of ophthalmia neonatorum, although he adduces no grounds for this opinion, which is at variance with the one usually accepted. It is interesting to note, as bearing upon prognosis, that of 326 cases of ophthalmia seen at two London special hospitals, five only developed affections of the cornea whilst under treatment. In each of these unfortunate cases attendance at the hospitals for treatment had been irregular. SYDNEY STEPHENSON.

(13) **Hellendall** (Düsseldorf) has modified Credé's method in the following way:—Ampullæ, each containing 0.5 c.cm. of a 1% solution of silver nitrate, are provided. The ends of the little receptacle are broken off, and the liquid transferred to an ordinary pipette provided with a wool filter at the lower end. There are in all 10 drops for use, of which 5 to 6 drops are retained by the wadding, so that there remain two drops for each eye.

XIV.—THE PULSE-TENSION IN OPHTHALMOLOGY.

Dunn, John.—Some remarks on the practical value of the sphygmomanometer to the ophthalmologist. *Archives of Ophthalmology*, November, 1908.

With the possible exception of the brain, no part of the human body offers so many problems in connection with disturbances of the blood-pressure as the human eye. **Dunn** (Richmond, Va.) attempts to show the practical importance attending a more general use of the sphygmomanometer in the routine investigation of certain diseases of the eye.

1. **Glaucoma.**—In Dunn's opinion, no case of glaucoma can nowadays be considered as fully examined unless the pulse-tension has been measured with the sphygmomanometer, and the information thereby attained has been given proper consideration. Dunn has invariably found the pulse-tension above normal in cases of essential glaucoma. In glaucoma prognosis *quoad visum* is worse the higher the pulse-tension, and *vice versa*. As a general rule, the author claims that the chances of iridectomy yielding a successful result in simple chronic glaucoma vary with the pulse-tension, being better the closer the latter approaches to the normal reading. "Operative procedures," he remarks, "undertaken for the relief of essential glaucoma, acute or chronic, in the presence of a high tension pulse, with demonstrable nephritis, are apt to be wholly failures and may necessitate the removal of the eyeball." The author believes that the higher the pulse-tension, the more likely is the use of a mydriatic to be followed by the onset of glaucomatous symptoms. The pulse-

to — therefore, may decide for or against the employment of a mydriatic in a given case. Lastly, the sphygmomanometer may indicate the desirability or otherwise of blood-letting as a remedial agent in attacks of glaucoma.

2. **Corneal ulcerations.**—In the treatment of corneal ulcerations, the pulse-tension may suggest why a particular case is very obstinate, and may forbid or admit of the use of atropine. It may suggest the desirability of paracentesis. It may point to the advisability of employing physostigmine. Lastly, it may explain why the use of a mydriatic, apparently indicated, produces a complicating attack of glaucoma.

3. **Cataract.**—Dunn is convinced that the extraction of immature cataract does better the more nearly the general blood-pressure approximates to the normal, and he allows this consideration to weigh heavily in deciding whether or not to advise the removal of a slowly-developing senile cataract. A high blood-pressure argues that degenerative changes, present in the intra-ocular vascular system, will interfere with the resorption of any cortical remains left behind by the operation, a consideration that applies equally to mature and immature cataracts.

4. **Iritis.**—In a case of recurrent iritis in a patient of 46 years there was intense pain, which the usual remedies, internal and external, failed utterly to relieve. The pulse-tension was 220 (normal 120), and acute nephritis was present. Bleeding from the temple instantly relieved the pain. In a second case of iritis, with pulse-tension of 120 and no renal complications, bleeding afforded but little relief to the severe pain that was present.

Dunn's paper concludes with some observations as to the value of a knowledge of the pulse-tension readings in 5. **Retinal hæmorrhages**, 6. **Optic papillitis**, 7. **Migraine**, and 8. **Uncomfortable sensations about the eyes** for which no satisfactory explanation is forthcoming.

SYDNEY STEPHENSON.

XV. AFFECTIONS OF THE EYE IN CAISSON DISEASE.

Pick—Affections of the eye in Caisson Disease. (*Augenerkrankungen bei Caisson-Arbeitern.*) *Centralbl. für prak. Augenheilk.*, Juni, 1907.

The construction of a great bridge at Königsberg has furnished many cases of Caisson Disease. Of these very few had eye symptoms, but the following case reported by **Pick** (Königsberg) was of a distinctly exceptional kind. The patient, 27 years of age, had just done his first day's work of 8 hours at a depth of 17 metres. Decompression lasted ten minutes, and immediately after he had a feeling of lassitude, severe pains in the limbs and weakness, so that he could not walk. During the first few days the pains decreased, but the weakness increased, and on the 5th day he had delirium and high fever. Cheyne Stokes respiration; optic neuritis; normal pupil reactions. He recovered completely in one month. The course of the eye affection was as follows. On the 6th day discs much injected, margins obscured. Veins much dilated. Arteries normal. The macular region somewhat oedematous, and situated around it were some 18 spots of retinitis of opaque homogeneous appearance, and all were situated at the small terminations of veins. Three days later a small hæmorrhage appeared at the end of one of the macular veins. And a few days later the whole began to disappear, so that at the end of another fortnight no sign of the pre-existing trouble could be seen, and vision had become normal.

A. LEVY.

XVI.—GLAUCOMATOUS ATROPHY OF THE IRIS.

Hirschberg, J.—Circumscribed atrophy of the lesser circle of the iris in glaucoma. (*Der umschriebene Schwund im kleinen Kreis der Iris bei Drucksteigerung.* *Centralbl. f. prak. Augenheilkunde*, Juni, 1907.

Hirschberg (Berlin) states that partial atrophy of the iris is frequent after acute attacks of increased tension—even when this latter has lasted only for one or two days, and he puts forward the following statements:—

(1) Permanent dilatation of the pupil occurs occasionally in cases of mild inflammatory glaucoma, even when physostigmine suffices to produce normal vision and field. This is due to partial atrophy of the lesser circle of the iris.

(2) When a healthy eye suddenly develops a severe attack of glaucoma and is immediately and successfully operated on, one frequently sees bluish depressed spots in the lesser circle of the iris, due to partial atrophy.

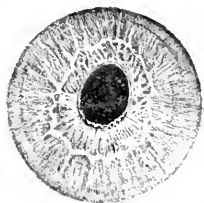


FIG. 1.

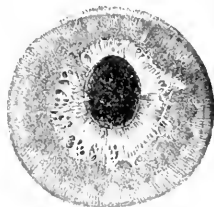


FIG. 2.



FIG. 3.

(3) In all cases of inflammatory glaucoma where the operation has preserved a fair amount of vision—and where a year or more later a permanent dilatation of the pupil occurs, one always finds a circumscribed atrophy in the lesser circle of the iris.

(4) In pressure-atrophy of the eyeball, one finds these spots of atrophy, both in the greater and lesser circles of the iris.

The appended figures, taken from Hirschberg's original communication, convey a good idea of the changes in question.

A. LEVY.

XVII.—MACULAR HOLES.

Coats, George.—The pathology of macular holes. *Royal London Ophthalmic Hospital Reports*, Vol. XVII, Part 1, p. 69.

Macular holes consist of perfectly circular, sharply circumscribed spots, measuring $\frac{1}{3}$ to $\frac{1}{2}$ the diameter of the disc, situated exactly at the fovea, and with the surrounding retina slightly opaque. The floor is of a clear dark-red colour, and often stippled with small yellow spots, and it is slightly below the level of the retina, although seldom sufficiently marked to be measured with accuracy with the ophthalmoscope. In spite of the similarity, scarcely any

two cases are exactly alike, but when once present, they remain permanent. In 1860 Knapp was the first to describe the condition, which in his case had followed a blow with a clod of earth four weeks previously. In 1875 Noyes saw a case which followed an injury with a cork three years before; and in the same year Pagenstecher and Genth made the first pathological examination of a case. In 1900 Menteith Ogilvie collected 10 cases, and pointed out that although the retina is thinnest at the fovea, it is thicker around it than elsewhere, and is therefore better able to withstand rupture from violence. In 1901 Fuchs examined the condition pathologically: the outer nuclear layer and the membrana limitans externa were all that remained at the fovea, the choroid beneath was intact. The same year N. Bishop Harman described a case in which the injury was received 43 years before. Nearly every case has followed a blow, but in 1904 de Schweinitz reported a couple of cases which arose spontaneously; in one there was aortic obstruction with much arterio-sclerosis, and in the second there was serous iritis. In 1904 von Hippel reported a case following an extraction nine years previously in which vitreous was lost and the eyes became inflamed. Several other surgeons have observed cases, by far the majority of which are due to injury, but up to the present no case has been seen both ophthalmoscopically and microscopically.

Coats (London) reports four cases. The first was observed in the bisected eye; the second was not observed either clinically or macroscopically, but it shows that cystic spaces in the fovea may result in the formation of an actual gap. The third resembled the first, but was not seen with the *loupe*. These cases lend support to the theory of retinal œdema as being the cause of macular holes, as opposed to the theory of direct rupture at the time of injury. The fourth case showed that such a rupture might occur in exceptional instances, but that it probably would not give rise to the ophthalmoscopic appearance of a macular hole.

From the study of these cases Coats concludes that macular holes are produced by an œdema of the retina at the posterior pole. This œdema may not be confined to this spot, but the appearance of the hole will only be apparent here if there is a defect of the inner layers of the retina. No doubt for this complete picture a total defect of all the layers is necessary, and Coats' second case shows that this may arise from retinal œdema only. This œdema may be caused by injury, or it may arise from toxins in the vitreous, the result of irido-cyclitis, or, lastly, from retinal vascular disease. Rupture of the retina at the time of the injury is *not* the cause of macular holes. Six photomicrographs illustrate Coats's paper.

C. DEVEREUX MARSHALL.

XVIII.—TUBERCULOUS AFFECTIONS OF THE EYE.

1. Capolongo, C.—Tuberculosis of the conjunctiva; a clinical, anatomical, and experimental contribution. *Annali di Ottalmologia*, Vol. XXXV, fasc. 12.
2. Fage. Secondary tuberculosis of the conjunctiva. *Bull. et Mém. de la Société Française d'Ophthalmologie*, 1908, p. 361, and *Annales d'Oculistique*, juillet, 1908.
3. Posey, William Campbell. Some remarks upon tubercular keratitis, with reports of case. *Ophthalmic Record*, August, 1908, and *Monthly Geographic and Medical Bulletin*, September, 1908.

- (4) **Krauss, W., and Brueckner, A.**—A clinical study of tuberculosis of the fundus oculi. *Archiv für Augenheilkunde*, Bd. LVII, No. 3, and *Archives of Ophthalmology*, September, 1908.
- (5) **Fejér, Julius.**—A rare case of solitary tubercle of the choroid. *Centralbl. f. prak. Augenheilkunde*, September, 1908.

(1) The two cases reported by **Capolongo** (Naples) illustrate tuberculosis of the conjunctiva very well as regards the clinical appearances, differential diagnosis, and experimental control. The first case especially, that of a certainly heredito-syphilitic girl, might have made one think of a gummatous ulceration but for the bad effects of mercurial treatment and the positive results of inoculation in animals. In the second case the characters were rather papillomatous, or granulomatous, than ulcerative. In both cases there was pronounced preauricular and parotid and submaxillary adenitis. Excision and free cauterization brought about a cure.

A. ANTONELLI.

(2) In 1903 a girl, aged 20, consulted **Fage** (Amiers) for a fungating tumour, the size of a hazel nut, situated in the region of the right lacrymal sac, and accompanied by swelling of the pre-auricular and submaxillary glands on the same side. In operating on this a carious patch was found on the ascending process of the superior maxilla, with an opening communicating with the maxillary sinus, which contained fungating masses. The opening was enlarged and the sinus curetted, with the result that at the end of two months the patient was considered as cured. In 1907 the patient returned with the following conditions: (1) a patch of lupus the size of a franc on the right side of the nose, (2) some small ulcerations covered with crusts on the tip of the nose, (3) a patch of lupus in the right nostril, (4) a number of fungating reddish masses on the tarsal conjunctiva of the upper and lower lids of the left eye, (5) enlargement of the left pre-auricular gland. The Calmette reaction was positive in the healthy eye; sections of pieces excised from the diseased tissue showed typical tubercles, but no bacilli could be found in them; and inoculation in a guinea pig gave a positive result. The vegetations were repeatedly excised and cauterised, the lupus was treated with radium and high frequency currents, and the patient was put on a course of cod liver oil and over feeding with injections of cacodylate of soda, with the result that at the time when the article was written the diseased tissue had quite disappeared from the conjunctiva and there was no more abnormal secretion, the enlargement of the pre-auricular gland had disappeared, and the lupus was much improved. Fage considers that the conjunctiva was probably infected directly from the lupus by the patient's hand or handkerchief.

R. J. COULTER.

(3) Experience has taught **Posey** (Philadelphia) that tongue-like areas of yellowish-white infiltrate projecting from the limbus into the interstitial lamellæ of the cornea towards its centre, and discrete yellowish-white oval spots, which appear caseous and avascular, are significant of tubercular keratitis. He has also observed small rounded secondary areas "resembling drops of cold mutton fat" either upon the posterior surface of the cornea or in the corneal lamellæ in cases of tubercle of the iris and deeper structures of the eyeball.

CHARLES A. OLIVER.

(4) **Krauss** (Marburg) and **Brueckner** (Würzburg) give a full report, with chromolithographic illustrations, of a couple of cases of tuberculosis of the fundus oculi.

The facts, in abstract, follow:—

Case No. 1. A man, aged 19 years, admitted April 25th, 1905, with the history that the sight of one eye had been dim for about nine months. His mother had died from some lung trouble. The

point, was tall, thin, and pale, presented suspicious signs at each apex. The fundus of the left eye had extensive changes, the most striking of which took the form of a gross whitish area, some 2 mm. in diameter, in the macular region, and lying beneath the retinal vessels. Most of the enclosed area, which represented detached retina, was prominent (2.5 mm.). It was partly reddish and partly greenish. The detachment was not tremulous, gradually descended to the level of the surrounding white area, and showed a number of retinal hemorrhages, old and recent. There were no deposits of pigment within the white ring. V., fingers at 2 m. to 3 m. Tension somewhat minus. A positive reaction, general and local, followed the injection of 0.5 mg. of old tuberculin. When the patient was last examined in April, 1906, the white area had progressed so far upwards that no normal retina could be recognised, and some fresh hemorrhages were also present.

Case No. 2. A lad, aged 14 years, admitted December 11th, 1905, on account of dimness of the left eye of three to four weeks' duration. History of pulmonary trouble in family, but physical examination of patient yielded negative results. L.E. Tension normal. V.—Fingers at 1 m. Floating opacities in vitreous. An enormous area, of yellowish-white colour, lay beneath the retinal vessels, and occupied much of the lower outer quadrant of the fundus. It gradually merged into normal retina by breaking up, as it were, into yellowish-white dots, which became more and more discrete. On the summit of the white area, which was about 2.5 D. more prominent than the optic disc, were a number of hemorrhages, mainly in connection with the small arterial twigs. The fundus in the neighbourhood of the large patch contained numerous ecchymoses and white dots. Two injections of old tuberculin, 2 mg., produced no general reaction, although local reaction was observed. Later, there was marked increase in the vitreous opacities. When seen on March 4th, 1907, the fundus picture had changed but little.

The authors believe that both the above cases are to be accounted for by a chronic tuberculosis affecting mainly the retina and the choroid to a less extent. They quote somewhat similar cases by Siegrist (*Trans. Ophthalmological Society, Heidelberg, 1896*) and by Carpenter and Stephenson (*Die Ophthalm. Klinik, 1906, p. 494*).

SYDNEY STEPHENSON.

(5) Fejér (Budapest) reports the case of a woman, aged 36 years, who in August, 1907, developed a deep scleritis in the left eye. This gradually recovered, but she had many relapses, and in the later relapses the iris also took part. There was no history of syphilis, but a strong history of tubercle, and the lady herself had pleurisy five years previously and a tuberculous peritonitis four years ago. At the end of September she went to Davos and received a few tuberculin injections. At the end of October she returned, and complained of opacities in front of the left eye, which, on examination, showed a yellowish tumour projecting into the vitreous with the retina stretched over it and about 2 mm. high. V. 5/10. She was treated with tuberculin and hygienic measures, but the eye got steadily worse, until at the end of May V. 4/70, and the upper part of the field of vision had gone completely. The eye was not enucleated, as the other tuberculous affections which this patient had had showed a tendency to heal, and it was hoped that the same would happen in the eye. If the tuberculous process had been in the neighbourhood of the disc, enucleation would have been done, as then there is danger of extension to the cerebral meninges.

A. LEVY.

THE DIAGNOSIS OF OCULAR TUBERCULOSIS.

- (1) Schiele, A.—The relations of the ophthalmo-reaction of the tuberculin test to tuberculosis and trachoma. *Die Beziehungen der Ophthalmo-Reaktion des Tuberkulin-Test zu Tuberkulose und Trachom. Wochenschrift für Therapie und Hygiene des Auges*, 5 December, 1907.
- (2) Daniels, Polah, L.—Some drawbacks of the ophthalmo-reaction of Calmette. *Eenige bezwaren der ophthalmo-reactie von Calmette. Ned. Tijdschrift voor Geneeskunde*, 1908, No. 2.

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- (20) Heywood, C. Christopher.—Calmette's tuberculin reaction. *Lancet*, Nov. 28th, 1908.
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1) Schiele gives in tabular form the results of the Calmette ophthalmo-reaction to tuberculin in 68 cases, including various conditions. Among them there were 9 positive results in 11 cases of follicular conjunctivitis, and 18 in 27 cases of trachoma. Seven of the nine negative cases of trachoma had been treated by the author's iodic acid method (THE OPHTHALMOSCOPE, Vol. III, p. 244). The following are the conclusions given by him: the tuberculin ophthalmo-reaction gives successful results as a method of diagnosis in tuberculosis and trachoma. Follicular disease of the conjunctiva (trachoma) must be excluded before drawing conclusions as to the presence of tubercle within the organism. This test should not be employed in cases of advanced trachoma, since it may produce a severe exacerbation with involvement of the cornea, one instance of which is related. The positive result of the ophthalmo-reaction in both follicular conjunctivitis and trachoma supports the theory of the identity of the two conditions. The author's cases are too few for such an assumption, and the presence of a latent tuberculosis was not excluded. The negative results in the trachoma cases under treatment with iodic acid pencil are claimed as proof that the latter has destroyed the trachoma poison, although all follicles and inflammatory symptoms had not disappeared. Several of these seem to have been cases of follicular conjunctivitis. The inflammatory reaction following this tuberculin test in eczematous conjunctivitis and trachoma when accompanied by a fresh outbreak of phlyctenules and trachoma follicles respectively, may cause such formations to occur on any region of the entire conjunctiva.

W. B. INGLIS POLLOCK.

(2) Daniëls, is not satisfied with Calmette's reaction. The drawbacks are the rather serious affections of the eyes experimented on. He saw chemosis, hemorrhage, ciliary injection, and once phlyctenulae, immediately following the instillation.

G. F. ROCHAT.

(3) Von Tbenkelom found the reaction positive in all cases (19) where tuberculosis was clinically without doubt present. Of 40 children without signs of tuberculosis, 38 gave no reaction, 2 were positive. The author saw fever, pain, and severe conjunctivitis consequent to the application. He thinks that a negative result of the reaction is valuable to exclude tuberculosis in doubtful cases.

G. F. ROCHAT.

(4) At the time when Nance (Chicago) and Swift (Chicago) wrote, comparatively little work had been done in the diagnosis of tuberculous eye lesions by the Calmette method. The authors adopted the plan in 22 instances, and obtained positive reactions in 14 of the cases, which, included instances of phlyctenular disease (6), sclerotizing keratitis (1), scleritis (1), iritis (2), choroiditis (3), interstitial keratitis (2), chronic conjunctivitis (1), and papillitis (1). A 1 per cent. solution of tuberculin was employed. The series included one reaction alone that was of sufficient severity to call for treatment. The authors conclude that the discovery of Calmette offers a clear, intelligible, trustworthy, and convenient method of diagnosing the presence of tuberculous foci in the body.

SYDNEY STEPHENSON.

(5) Recently, the Calmette eye reaction has been much discussed, and a few cases of severe eye trouble following its use have been recorded. To these **Fischer** (Dortmund) now adds a case where the eye was considerably damaged, thereby entailing months of suffering and trouble. The patient was a man of 46, who three years previously had had a small hæmoptysis, and two years ago a slight affection of the apex of the right lung; otherwise, the man had always been perfectly healthy, and was at the time in perfect good health. A single drop of tuberculin was placed in the right conjunctival sac. The reaction was very violent, and lasted about three weeks. Then there followed a crop of phlyctenules and ulcers of the conjunctiva which healed very slowly. Two months after the instillation, a large ulcer developed on the corneal margin which progressed for a while and was only cured after a month of energetic treatment, leaving a scar, and the eye after three months of this is still inflamed, irritable, and the vision has sunk very appreciably. Whoever has had such an experience is not likely to use the Calmette reaction again, and it must now be recognized that the employment of this test is not devoid of danger.

A. LEVY.

(6) **Marques'** results confirm those of others as to the value of Calmette's reaction, which he regards as practically free from risk.

HAROLD GRIMSDALE.

(8) **Aubineau** (Brest) has tried the Calmette reaction in 13 diseased eyes with the result that out of nine positive reactions, seven were complicated by the occurrence of fresh disease, which in three of them caused reduction of visual acuity. Comparing these results with those of Lenoble, who in 69 positive reactions in healthy eyes met with complications only once, the author concludes that the method is absolutely contradicted in eyes showing recent or old signs of tuberculosis or of affections such as keratitis occurring in childhood which may be due more or less directly to tuberculosis.

R. J. COULTER.

(10) **Seligmann** (Hamburg) remarks that Wolff-Eisner has provided us with a new disease, namely, one due to excessive reaction to the local application of tuberculin. He uses a 1% solution of Koch's old tuberculin, but if there is any suspicion of a tuberculous affection of the uvea, he commences with a 1: 10,000 solution, which he gradually increases. Acting thus he has not seen any dangerous result in 1,300 experiments. Seligmann classifies the various degrees of the reaction. The first is the pure conjunctival reaction, which may be more or less severe. Then follows the ophthalmo-reaction, in which there is ciliary injection, phlyctenule, nodular formations in the conjunctiva, keratitis, episcleritis, and even iritis. A severe reaction may be expected in eyes suffering from conjunctivitis; those which have already given a tuberculin reaction; trachomatous eyes; and, finally, eyes definitely tuberculous. In such cases the simple conjunctival reaction may easily pass into the dangerous ophthalmo-reaction. Many of the bad results have been obtained with French tuberculins, which are really 10—20 times as strong as a freshly prepared solution of old tuberculin. The reason is that the tuberculin is precipitated with alcohol and the solution not reckoned according to the original volume, but from the weight of the dried substance. It must also be remembered that Calmette's tuberculin is prepared, not from human, but from bovine bacilli. Seligmann describes a most unfortunate case which he had in his own practice after the use of Calmette's tuberculin. The article is illustrated by somewhat crude coloured drawings of the eyes at various stages of the disease. Ultimately, yellowish nodules appeared in the conjunctiva and a dotted infiltration developed in the cornea. The whole condition was quite unlike any known

pathological process: it was a disease *sui generis*. The condition improved, but permanent macule remained. The author has investigated the cytology of the disease. The leucocytes underwent a kind of necrosis; the tuberculin acts like an acid, attacking the basophil leucocytes but leaving the oxyphil granulations unaltered. These changes are well shown by a beautiful plate, which should be studied by those interested in conjunctival cytology. No organisms were ever found, except some xerosis bacilli; the whole process was a toxic one. The author believes that the toxin remains for several days in the tissues, and can at any time give a delayed reaction, or a secondary exacerbation of the primary reaction. He finds that phlyctenulæ often appear, not only after Calmette's procedure but also after Pirquet's cuti-reaction. They are common in children but rare in adults. He regards the nodules as miliary tubercles, and points out that in the cuti-reaction the late papules have the histological structure of true tubercles.

The title of the paper is somewhat misleading, for Seligmann says nothing about the means of avoiding these unpleasant complications, except to quote Wolff-Eisner's methods.

T. HARRISON BUTLER.

(12) Until within a comparatively recent period, according to Derby (Boston), tuberculosis of the eye was regarded as a rare disease. The statistics of Horner showed 1 case in 4,000; of Hirschberg, 1 in 5,000; of Groenouw, 1 in 4,600; of Eyre, 1 in 3,000; and of Stephenson, 1 in 1,500. On the other hand, Helbron reported that in the Berlin *klinik* 1 case in every 200 was tuberculous. In 59 cases, again, of chronic uveitis tested subcutaneously by Stock with tuberculin, 61 per cent. gave a positive reaction, and 87 per cent. of the cases of scrofulous disease (23 in number) reacted. Hess reported over 50 per cent. of positive reactions to tuberculin in 100 cases of eye disease. The discrepancy between the earlier and the later figures dealing with the frequency of ocular tuberculosis is obviously to be explained by a difference in the methods of diagnosis. Once the diagnosis could be confirmed only by finding tubercle bacilli in the diseased tissues or by the inoculation of animals. The introduction of tuberculin has naturally led to the recognition of a greater number of cases of tuberculous eye disease. The subcutaneous test, however, cannot be applied to out-patients, with the consequence that its use is confined to a relatively small number of cases. It has, nevertheless, added vastly to our knowledge of tuberculosis of the eye. But the recent introduction of the ophthalmic-reaction (Wolff-Eisner and Calmette), and of the cutaneous reaction (von Pirquet) has greatly extended the applicability of diagnosis by tuberculin. Derby has conducted extensive experiments with both the newer methods, employing 1 per cent. tuberculin almost exclusively for the former, and 25 per cent. tuberculin for the latter. His experiments were made upon out-patients, a fact that serves to strengthen the conclusions he has reached as to the frequency of ocular tuberculosis. Of 103 cases, 83 reacted positively, 18 were negative, and 2 were inconclusive. The conjunctival test was carried out 61 times, with 45 positive, 14 negative, and 2 doubtful results. The cutaneous test was performed 58 times, with 52 positive, 14 negative, and 2 doubtful results. In 16 patients both methods were employed, and in 14 both were positive; once the skin test was positive and the conjunctival negative, and once both were doubtful. As regards cases believed to be tuberculous (type of disease, history, or general appearance of patient), Derby counts 93 cases. Of this number, 43 were instances of phlyctenular disease, of which 38 reacted and 5 did not. There were 10 cases of relapsing sclero-keratitis, of which all yielded a positive result. Of another 10 cases of scleritis, 13 gave a positive, 2 a negative, and

1 a doubtful reaction. Of 9 cases of uveitis, all gave a positive result when tested with tuberculin. Of 3 cases of interstitial keratitis, 2 were positive. In 4 cases of cloudiness in lens and vitreous, 1 was positive, 2 were negative, and 1 was doubtful. A case of tuberculosis of the conjunctiva gave a positive reaction. Three cases of chronic dacryocystitis gave a negative result. Other cases included optic atrophy, episcleritis, corneal ulcer, choroido-retinitis, and chalazion.

In four instances a reaction did not occur until after forty-eight hours, two of the reactions being conjunctival, one cutaneous, and one both conjunctival and cutaneous. The patient appeared to be in excellent general condition, which accords with Wolff-Eisner's view, namely, that this is the reaction of the clinically healthy who have an encapsulated focus. Derby has met with several severe conjunctival reactions, particulars of which he includes in his communication. His experience leads him, on the whole, to look upon the cutaneous reaction as more sensitive than the conjunctival. He has experienced no untowards results from the cutaneous test, the reaction from which has varied from a slight redness and swelling of the vaccinated area to a very marked redness and puffiness of some extent, and on several occasions to the formation of a bleb. The present weight of evidence tends to prove that v. Pirquet's method is specific and of great value. In ophthalmology it will probably supplant Calmette's method, since all that can be charged against it in the way of complication is the exceedingly rare occurrence of a mild type of lymphangitis, possibly due, after all, to faults in asepsis. The Calmette reaction, on the contrary, has been known to produce serious affections of the eye.

It is now admitted that scleritis, sclero-keratitis, and uveitis are often of tuberculous origin, but the case is not so clear as regards phlyctenular affections of the eye. Derby's figures strongly support the tuberculous origin of phlyctenular disease. Thus, of 43 cases, no fewer than 38, about 88 per cent., reacted to tuberculin, and in 19 of the cases physical examination brought to light evidence of tuberculosis in 16—that is, nearly 89 per cent.

In short, Derby believes that formerly only the hopeless cases, leading to destruction of the eyeball, were recognised as tuberculous, but that now we are beginning to recognise the milder and curable type of ocular tuberculosis.

Derby's views on treatment, apart from local measures, may be summed up as follows.—Cases of ocular tuberculosis should be handled like other kinds of tuberculosis. The first indication is to build up the general health, and to impress upon the patients the fact that tuberculosis is a chronic process, and that a cure will certainly occupy several months. The strictness of the *régime* should, in a general way, be proportionate to the severity of the disease. The so-called "tuberculosis class" forms an admirable way of reaching out-patients. There the patient is examined, weighed, and his temperature is taken. He is given directions as to general living, fresh air, food, exercise, and so forth. He is presented with a book, in which he has to make a careful record of his daily life. He is visited in his home by one of the class-workers, shown how to live in the fresh air, and, when necessary, he is occasionally helped with money. Some of the patients can be referred to the day-camp in the warmer seasons of the year. Now and then a patient can be sent to the sanatorium. Tuberculin has been used in most of Derby's patients. He is by no means convinced of its therapeutic value, although he admits that it does no harm when proper precautions are observed. At the same time it is evident that careful building up of the patient does good and that recovery ensues by those means and by appropriate local measures, unless the disease has progressed too far before treatment is instituted.

SYDNEY STEPHENSON.

(13) **Torok** (New York) believes that the most trustworthy way of diagnosing tuberculosis, as well as of treating that disease, is by the use of tuberculin. He agrees with Reuchlin's dictum, which is to the effect that if a patient suffering from a suspicious inflammation of the eyes reacts in the typical manner to small quantities of old tuberculin, the existence of an active tuberculosis may be taken as proved. For purposes of diagnosis Török always employs Koch's old tuberculin (T.V.) diluted with 0.25% phenol solution. As a preliminary to the injection of tuberculin, the patient's temperature is taken every two hours for a few days. If found to be normal, 1 mg. of the tuberculin is injected subcutaneously in the interscapular region at 8 o'clock p.m. If no reaction be manifested within 48 hours, 3mg. are injected, and in case of a negative result, 5 mg. after a couple of days. Children are subjected to an identical procedure. Reaction may be local or general. The general, in typical form, shows itself as a sudden rise and equally sudden fall in the body temperature within a few hours to one or two days after the injection of tuberculin. Headache, nausea, dizziness, vomiting, and pain in the extremities may or may not accompany the rise in temperature. The local reaction consists in an increase of any inflammatory symptoms that may be present prior to injection. It is not so important as the general reaction. Török expresses his belief that when the affection of the eye suggests tuberculosis from age, clinical picture, heredity, or other circumstances, and when a typical general reaction comes on after administering small quantities of T.V., not exceeding 5mg., we can positively make the diagnosis of tuberculosis, even in the absence of local reaction.

For therapeutic purposes Török employs new tuberculin (T.R.) given by subcutaneous injection three times a week. He begins with 1 500 mg. and increases the dose gradually by 1 500 mg. up to 1 50 mg. The dose is then increased by 1 50mg. to 1 5 mg., and then by 1 5 mg. to 1 mg. by 1 5 mg. each injection, according to the method suggested by von Hippel. Out-patients are treated by this plan. A record is taken of the temperature every two hours. Should injection be followed by reaction, the patient remains in bed until the temperature subsides, which rarely takes longer than six or eight hours. In Torok's experience, this practice is free from risk and is preferable to treatment in hospital. Twenty-two cases of ocular tuberculosis have been treated on the foregoing lines with benefit in all but two. The series included tuberculous scleritis (9), conjunctival tuberculosis (5), iritis (4), choroiditis (3), and interstitial keratitis (1).
 SYDNEY STEPHENSON.

(15) **McKee, Campbell, and White's** review of this subject hardly takes us appreciably further than the Review which appeared in *THE OPHTHALMOSCOPE* for July, 1908. Their conclusion that "the results of the ophthalmo-tuberculin test, on the whole, are as yet contradictory" exactly corresponds with that arrived at in the latter article. The authors bring forward two cases as follow:—

Case 1. A child of 4 years, with osteomyelitis of the tibia, developed a severe membranous conjunctivitis after instillation of a drop of 1 per cent. tuberculin. No pathogenic germs could be found.

Case 2. Macropurulent conjunctivitis, which developed into a phlyctenular type, resulted from the instillation of a drop of 1 per cent. tuberculin in a person, aged 10, with a tuberculous hip.

The authors conclude that it is established that the test should not be applied in an eye involved in any process of disease, with a 0.5 or 1 per cent. solution, because of the danger of excessive reaction. **ERNEST THOMSON.**

(16) **Wilson's** conclusions are as follows: a positive reaction is fairly reliable evidence of the existence of tuberculosis. A negative result does not exclude the possible presence of tuberculosis. In properly selected cases and

with tuberculin of proper strength the test is free from any serious danger. Tuberculin solutions of 0.5 per cent. are to be preferred in all cases; solutions of greater strength should rarely, if ever, be employed. The test is of value from the standpoint of prognosis; a prompt and vigorous reaction indicating that the patient is successfully combating the disease. Very advanced and moribund cases fail to react; also cases of miliary tuberculosis. The administration of tuberculin in moderate amounts, subcutaneously, will not develop the reaction in healthy persons. In tuberculous patients it accentuates the pre-existing inflammation, and may cause the appearance of the reaction. It apparently fails to develop the reaction in cases of acute miliary tuberculosis. The theory of the existence of the state of anaphylaxis or local hypersusceptibility best explains the occurrence of the reaction. No more than two instillations should be made, the opposite eye being employed for the second test. The state of anaphylaxis or local hypersusceptibility produced in healthy persons is apparently not transferred to the opposite eye. The sensitization in the eye does not seem to be followed by a general hypersusceptibility, manifested by a reaction to the subcutaneous injection of tuberculin. In the great majority of cases no constitutional symptoms are associated with the reaction. No alteration occurs in the physical signs, such as frequently occurs following the administration of tuberculin subcutaneously. A certain proportion of enteric fever cases give a positive reaction. This is most apt to occur in patients who are convalescing. As yet there is no definite evidence for regarding it as a group reaction. When the lesion is well headed and inactive, a negative result is often obtained. The test should not be resorted to if the diagnosis can be made by physical signs and symptoms.

CHARLES A. OLIVER.

(20) **Heywood** read a paper on Calmette's reaction before the Pathological Society of Manchester. He considers that the reaction is easy of application, harmless and trustworthy, and that a negative is more trustworthy than a positive reaction. The strength of tuberculin used should not be greater than 0.1 per cent. Excessive reaction is almost always due to the use of too strong a solution or to repeating the test on the same eye at too short an interval.

ERNEST THOMSON.

(21) In every case where a positive reaction was obtained, **Moyle** (London) states that tubercle was either found *post-mortem* or definite clinical signs were evident. Three inaccuracies out of 45 cases occurred, but the e were of the negative order. The solutions used were 0.50 to 1 per cent., made up from the powder. One patient reacted strongly; there were slight chemosis and photophobia. The patients, whose ages varied from 3 months to 14 years, were under the care of the senior physician to the East London Hospital for Children.

ERNEST THOMSON.

XX.—THE CROSSED-CYLINDER READER.

Gould, George M.—Doubling the reading power in Amblyopia by the Crossed-Cylinder "Reader." *American Medicine*, December, 1907.

For some years **Gould** (Philadelphia) has been in the habit of giving amblyopic patients, in whom deficient acuteness of vision is not too great, a much-increased ease and a longer period of time of reading by means of a rectangular crossed-cylinder lens of about three by four inches in size,

which magnifies uniformly an entire line of ordinary type. The contrivance is so light that it may be held for a considerable period of time in the hand without fatigue. It should be placed at its proper focal distance between the eyes and the objects looked at. The author has found it helpful to those who have a visual acuteness of from 20/50 to 20/200, enabling them to accomplish at least two or three times more than ordinary, and in many cases to read a size and a style of print which were previously indecipherable.

CHARLES A. OLIVER.

XXI.—VISUAL ACUITY.

1. **Pergens.**—The influence of size and number in the measurement of visual acuity. L'influence de la dimension et du nombre dans la mesure de l'acuité visuelle.) *Revue Générale d'Ophthalmologie*, 30 septembre, 1905.
2. **Williams, Charles H.**—Visual tests for railway and marine service. *British Medical Journal*, Dec. 29th, 1906.
3. **Blanco.**—The relation between the acuity of vision and the size of the sensorial retinal elements. Relacion entre la agudeza visual y el diametro de los elementos sensoriales de la retina.) *Arch. de Oftal.*, Sept., 1907.
4. **Parsons, J. Herbert.**—A clinical lecture on the diagnostic value of the visual acuity. *Lancet*, Nov. 30th, 1907.

(1) This fourteen page article by **Pergens** (Maeyseck, Belgium) is partly historical and partly gives the results of original experiments. It is not suitable for abstraction.

ERNEST THOMSON.

(2) **Williams'** is a paper describing the tests on various American Railways. One very interesting point may be noted, *viz.*, the effect of fatigue in reducing the acuteness of vision. It has been found by Denney that on a fast mail run of about 200 miles the acuteness of vision of the engineman at the end of the run is only about three-quarters of what it was at the beginning. A sufficiently high standard of acuity should be demanded to ensure that the vision will not be brought below the danger point by fatigue.

ERNEST THOMSON.

(3) **Blanco** concludes that the supposed relation is purely imaginary, and that we have to deal rather with physiological territories than with anatomical regions.

H. GRIMSDALE.

XXII.—THE ACTION OF REMEDIES UPON THE PUPIL.

1. **Batten, Rayner D.**—A report on the comparative action of homatropine methyl bromide, and homatropine bromide as a mydriatic. *Ophthalmic Review*, January, 1908.
2. **Henderson, E. E., and Parsons, J. Herbert.**—The action of cocaine on the pupil. *Ophthalmic Review*, November, 1908.

(1) The chief points to be determined are the rapidity of the dilating effect after two days and the duration of the dilatation. H. H. Dale concluded from his experiments on cats that the effect of the methyl bromide would pass off, as well as appear, more quickly than that of homatropine. This superiority **Batten** (London) did not find to be maintained in the human eye. The promptness of the dilatation with H.M.B., was if anything rather less than with H.B. in 1 per cent. solutions, but with 2 per cent. there was little if any difference between them.

The full dilatations with H.M.B. lasted for 2-4 hours, after which it passed off quickly, whereas the full dilatation with H.B. often lasted for 10-12 hours, the pupil gradually becoming normal in size from 36-48 hours. With 0.1 per cent. solution of H.M.B., the dilatation often passed off completely in from 5-9 hours and in 16 hours with a 2 per cent. solution. **Batten** concludes that the inconvenience caused to the patient by the use of H.M.B., is far less than that caused by H.B., and in some patients it begins to pass off in less than three hours.

C. DEVEREUX MARSHALL.

(2) In 1885 W. H. H. Jessop conducted some experiments on rabbits as to the action of cocaine, and from his researches he concluded that cocaine acts locally on the nerve-endings of the sympathetic in the iris, and that after excision of a portion of the sympathetic trunk no effect was produced on the pupil by the drug. In the light of our present knowledge as to the distribution and action of the sympathetic, these results are not easy to explain. **Henderson** (London) and **Parsons** (London) decided to repeat the experiments, and for the purpose they used two rabbits and a cat. In the first rabbit a portion of the left cervical sympathetic, 2 cm. long, was excised, and the following day both pupils reacted to light, cocaine applied to the right eye caused dilatation of the pupil, but had no effect on the left eye. This result remained constant for two years, when the animal was again anaesthetised and subsequently killed. It was then found that stimulation of the left anterior corpus quadrigeminum caused no effect on the pupil, but when applied to the right corpus it caused the right pupil to dilate.

The second rabbit was operated upon, and the superior cervical ganglion of the sympathetic was removed. It had the same effect on the pupil which has remained constant for three years, the animal being still alive. In the cat the effect was just the same as in the rabbit.

These experiments confirm Jessop's observations, and show that the result is permanent for more than two years, and that it makes no difference whether the sympathetic trunk is cut or the superior cervical ganglion is removed. No very satisfactory explanation of these phenomena is apparent.

C. DEVEREUX MARSHALL.

XXIII.—CYANOSIS OF THE RETINA.

- (1) **Uhthoff, W.**—On an ophthalmoscopic finding in so-called polycythæmia. (Ueber einen ophthalmoskopischen Befund bei sog. Polycytæmie.) *Klin. Monatsbl. f. Augenheilkunde*, November-Dezember, 1906.
- (2) **Jackson, Edward.**—Ophthalmoscopic appearances in chronic cyanotic polycythæmia. *Ophthalmology*, October, 1907.
- (3) **Tyson, Henry H.**—Cyanosis retinae. *Archives of Ophthalmology*, September, 1908.

1. The ophthalmoscopic changes observed by **Uhthoff** (Breslau) in a case of polycythæmia have relation to the veins, which appeared very dark, dilated, and tortuous. The dilatation was general but unequal; for constrictions in some and fusiform swellings in other places were of frequent occurrence. C. MARKUS.

2. **Jackson** Denver, describes the ophthalmoscopic appearances met with in a case of chronic cyanotic polycythæmia in a German Jewess of 60 years. The external signs of that infrequent disorder included purple lips and tongue, small varices in the cheeks, cyanosis of hands, trunk, and lower extremities, and passive hyperæmia of the conjunctiva. Marked dyspnoea on slight exertion, as when removing her clothes for examination of the chest. The urine, specific gravity 1012, amounted to nearly 2,000 c.c. in the twenty-four hours. It contained albumin 0.5 per cent by weight, in addition to epithelial casts. The blood was extremely dark, and coagulated very quickly. Red cells, 9,949,600, and white cells 6,500. Hæmoglobin 170 to 200. The spleen was not greatly enlarged. Whilst the woman was under observation, the pupils became unequal, vision decreased, and fundus changes developed. The latter took the form of: (a) several rounded hæmorrhages, and b tortuosity and dark colour of the retinal veins. No white spots were found, neither were the retinal arteries affected. The patient died from acute cardiac failure about three years after she first fell under Jackson's notice. No autopsy. There were some grounds for thinking that the patient's mother had also suffered from cyanotic polycythæmia during the later years of her life.

Commenting upon the foregoing case, Jackson points out that some fifty instances of cyanotic polycythæmia have been reported. In most of them enlargement of the conjunctival veins has been noted. In every case that has been investigated with the ophthalmoscope a dark colour and dilatation of the retinal veins have been observed. It seems doubtful whether any marked alteration in the retinal arteries has so far been recorded. The present is apparently the only case in which retinal hæmorrhages have been found.

SYDNEY STEPHENSON.

(3) **Tyson** (New York) has a brief communication upon cyanosis of the retina, a condition first described by Knapp in the year 1861. He enumerates the various congenital diseases and malformations of the heart that may give rise to changes in the fundus oculi, and in doing so points out that pulmonary stenosis is more frequently associated with cyanosis than is any other congenital lesion.

The polycythæmia of congenital obstruction to the pulmonary circulation is best explained, according to Tyson, on the view that it is compensatory. In other words, that the blood, like other tissues, hypertrophies, since the blood-forming organs are stimulated to greater activity in response to the increased demand for oxygen. A condition similar to the cyanoderma of congenital affections of the heart is to be found in the permanent hyperglobulia, accompanied by splenic enlargement and cyanosis, observed by Vasquez. Indeed, inasmuch as a congenital lesion of the heart may co-exist with trivial physical signs, a differential diagnosis between the two affections can sometimes be made only by the presence or absence of an enlarged spleen.

The case of cyanosis retine reported by Tyson, is briefly as follows:—

A boy, age 11.2 years, has been more or less cyanotic since a gastro-enteric convulsion at two years of age. He tired quickly, was very short of breath, and developed severe palpitation during mental excitement or after going upstairs. His chief complaint was dyspnoea on exertion. On examination, cyanosis of skin and mucous membranes, including the palpebral conjunctiva. Red blood cells, 8,080,000. White blood cells, 9,800. Hæmoglobin, 120. After the second and third

intercostal spaces to the left of the sternum was a loud and harsh murmur, apparently presystolic in time, although it was continued through most of the systole with altered characters, then being soft and blowing. The murmur was transmitted along the course of the pulmonary artery. The fundi were darker than normal, the optic discs appeared red, the retinal veins were blue-black, and the retinal arteries were the usual colour of the veins, both being dilated and tortuous, and extending to the visible periphery. *Diagnosis*.—Congenital patent foramen ovale with pulmonary stenosis.

Tyson states that in some cases of dementia præcox the retinal veins may be as large as those in cyanosis retinæ. In that condition, indeed, the veins may be to the arteries as 4 is to 1.

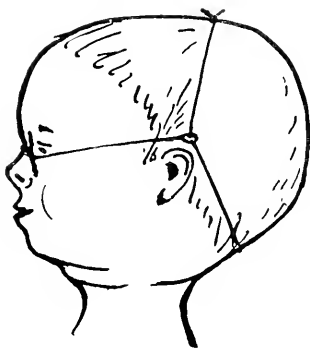
SYDNEY STEPHENSON.

XXIV.—SPECTACLE FRAMES FOR INFANTS.

Harman, Bishop.—Spectacle frames for Infants. *British Medical Journal* September 12th, 1908.

The *British Medical Journal* Report of Proceedings of the Ophthalmological Section of the Association, 1908, gives the following account:—

"Mr. Bishop Harman demonstrated 'A convenient mode of fastening spectacle frames on infants.' He said that spectacles were a regrettable necessity for infants of tender years in the treatment of squint. How to fix these frames on without injuring their delicate tissues was a problem. Curl sides could not be used; to succeed they must be frail, and children required strong frames, else the lenses were constantly out of centre. The usual practice was to tie them on by a tape or elastic passing behind the nucha, with a result that both the nose and the tops of the ears were badly abraded, and often ulcerated from pressure. He thereupon



demonstrated a simple mode of tying on the glasses which completely avoided these difficulties. A piece of tape, elastic or not, was looped under the nucha, its ends threaded through the eyes of the spectacle bows, then carried on to the vertex, where they were tied together. This circuit of tape held the spectacles firmly in position, yet allowed of sufficient elasticity to avoid pressure on the nose, and the bows were not dragged down on the tops of the ears. He had used the method extensively for nearly a year, and found it so satisfactory that he preferred it to curl sides for children under 7 years of age."

XXV.—PIGMENTATION OF THE OPTIC DISC.

- 1 Sattler, C. H.—Pathological pigmentation of the optic disc. *Arch. f. Augenheilkunde*, September, 1907.
- 2 Coats, George.—Congenital pigmentation of the papilla. *Royal London Ophthalmic Hospital Reports*, January, 1908.

1 The disc in Sattler's case presented the following appearances:—a mass of black pigment covers the temporal third, while fine granules of pigment are dotted all over the nasal side. The centre of the disc, which is free from pigment, appears to be on a level with the margins, so that there is no cup. No lamina cribrosa can be seen. The vessels, especially the arteries, appear diminished in size. V. 6. Div. strab. The patient, a girl, aged 15, had the following history:—when three years old she had a fall in which she injured the temporal margin of the orbit. A year after this divergent strabismus appeared. She does not remember when she became blind. Sattler thinks the pigmentation due to hæmorrhage at the time of the injury.

PERCIVAL J. HAY.

2 In a man of 69 years, Coats (London) found a pure-black pigmented area situated partly on and partly beyond the lower part of one optic papilla. The patch was swollen, probably about 2 D., and crossed by one or two retinal vessels. Its edges were soft, and had a reddish tinge upon the disc. A neighbouring area of the fundus, with very indefinite borders, seemed to be a little raised, and showed slight alterations in colour as compared with other parts of the fundus. A delicate, translucent, connective tissue film, which covered although it did not conceal the subjacent retinal vessels, lay concentric with the upper nasal quadrant of the disc. No change took place in the pigmented area during the fourteen months the patient remained under observation. Coats rules out sarcoma and pathological pigmentation as explanations of the ophthalmoscopic appearance and concludes that he had to do with a congenital anomaly. He assumes a congenital massing of the pigment epithelium by the side of the nerve entrance or possibly a simple congenital tumour of the choroidal stroma pigment, and of the two views favours, on the whole, the latter. The communication is illustrated by a beautiful coloured picture of the ophthalmoscopic appearances.

SYDNEY STEPHENSON.

XXVI. EXTIRPATION OF THE LACRYMAL SAC.

- 1 Elliot, Major R. H.—Some notes and observations on 310 consecutive operations for extirpation of the lacrymal sac. *Ophthalmic Review*, February, 1908.
- 2 Scimemi A procedure to simplify the operation for removal of the lacrymal sac. *La Clinica Oculistica*, Marzo, 1908.
- 3 Borsch.—The technique of extirpation of the lacrymal sac. *Bull. et Mem. de la Société Française d'Ophthalmologie*, T. XXV, 1908, p. 533.
- 4 Currie, O. J.—Extirpation of the lacrymal sac. *Lancet*, July 4th, 1908.

- (5) **Thompson, J. H.**—Removal of the lacrymal sac. *Journ. Missouri State Medical Association*, October, 1908.
- (6) **Wyler, Jesse S.**—Extirpation of the lacrymal sac: when and how? *Ophthalmology*, October, 1908.

(1) These operations were performed in Madras between May, 1904, and October, 1907. In all cases of troublesome and old-standing dacryocystitis **Elliot** (Madras) extirpates the sac. "Given an early simple case, in a man of means and leisure, we may adopt conservative treatment, always with the proviso, that failing success, we fall back on extirpation of the sac."

In making the incision, the author states that "it is practically never necessary to divide this ligament" (the internal palpebral ligament), "and it is most advisable not to do so," owing to the risk of deformity after healing. (It should be noted that many operators intentionally divide this ligament in order to give more room, and they claim that no deformity is ever produced.) The method of removing the sac is given in detail, after which a probe as large as possible (No. 9-12 Theobald) is pushed down the nasal duct as far as the palate, pushing the mucous membrane in front of it, and a red-hot, spindle-shaped cautery is thrust boldly down the duct, to ensure destruction of the membrane. Great care is taken to see that no particle of the sac is left behind, and, if necessary, the upper part of the cavity is freely cauterised with a ball-shaped, red-hot cautery. The cavity is cleaned and closed with three skin sutures, and the wound is not again dressed until the seventh day, when the stitches are removed and the eye is released. If a septic ulcer of the cornea is present, it is cauterised with the red-hot cautery and a paracentesis is done. Such eyes are opened daily, and protargol (1-8) is instilled, while atropine or eserine is used as occasion demands.

Lacrymal abscesses should be incised freely and the cavity curetted and sponged out with 1 per cent. sublimate. After about a month, the sac should be excised.

The complications of the operation are discussed.

Should it be contemplated to remove a cataract, and fluid, e.g., fluorescein, does not pass freely down the nose when instilled into the conjunctival sac, it is considered safer to remove the sac, which is usually found to be shrivelled and contracted. The difficulties of the operation have been overestimated; and in only one case out of 325 operations was it necessary to operate a second time owing to a portion of the sac wall being left behind, and this happened to be the fourth case of the series.

An elaborate analysis of the cases is given.

Tubercle was not present in any of the cases, but in a large number the sac lining showed well-marked follicles, and it is not improbable that these were identical with trachoma follicles, from which disease so many in Madras suffer.

C. DEVEREUX MARSHALL.

(2) **Scimemi** suggests that, as a preliminary measure, the sac should be injected with pyoktatin, and so coloured blue, and hence easily recognised. When it is not possible to inject the sac through the canaliculi, the fluid is injected by means of a hypodermic syringe through the skin.

H. GRIMSDALE.

(3) **Borsch** (Paris) after alluding to some of the reasons for the unpopularity of the operation for excision of the lacrymal sac, such as technical difficulty and excessive bleeding, describes his method. The latter essentially consists in filling the sac through the canaliculus with a very friable paraffin, employing for the purpose a special injector, made by **Moria**, of Paris. Enough paraffin is used to distend the sac moderately, and it is then removed in the ordinary way with no more difficulty than would be experienced in taking away a sebaceous cyst.

SYDNEY STEPHENSON.

6) Wyler (Cincinnati) describes the Viennese method of extirpating the ciliary sac, gives details of three recent cases in which he has performed that operation, and concludes in the words of Gendron) with the following indications:—1. Old dacryocystitis, with changes in the walls, and more or less severe ectasia; 2. Flow of pus, which has been handled by other methods over a period, without results, especially in the labouring classes; 3. Complicated with corneal ulcers upon the same side; and, 4. Preceding intra-ocular operation.

SYDNEY STEPHENSON.

XXVII.—REMEDIES.

- 1 Hirschberg, J. — A rare case of spontaneous cure of a detachment of the retina. (Ein seltener Fall von Selbst Heilung der Netzhaut Ablösung.) *Centralbl. f. prak. Augenheilkunde*, März, 1907.
- 2 Hesse, Robert. — Passive hyperæmia in Ophthalmology. (Die Stauungshyperämie im Dienste der Augenheilkunde.) *Centralbl. f. prak. Augenheilkunde*, Mai, 1907.
- 3 Fejér, Julius. — Contribution to the therapeutics of embolism of the central artery of the retina. (Beitrag zur Therapie der Embolie der Arteria centralis retinae.) *Centralbl. für prak. Augenheilkunde*, August, 1907.
- 4 Caspar, L. — Embolism of the central artery of the retina treated by massage. (Embolie der Arteria centralis retinae mit Massage behandelt.) *Centralbl. f. prak. Augenheilk.*, Oktober, 1907.
- 5 Denig, R. — Paracentesis of the anterior chamber in inflammatory processes of the uveal tract. *Ophthalmic Record*, March, 1908.
- 6 Krauss, Frederick. — Argyrosis due to the use of argyrol. *Ophthalmic Record*, March, 1908.
- 7 Salmon, Paul. — Arsenic in syphilis. (L'arsenic dans la syphilis.) *La Clinique Ophtalmologique*, 25 avril, 1908.
- 8 Kroemer. — Contribution to the tuberculin treatment of ocular tuberculosis. Contribution à l'étude du traitement par la tuberculine de la tuberculose oculaire.) *La Clinique Ophtalmologique*, 10 juin, 1908.
- 9 Villard, H. Complete temporary paralysis of the levator of the upper lid following a deep subconjunctival injection of 10 per cent. saline solution. (Paralysie complète, mais temporaire du releveur de la paupière supérieure consécutive à une injection sous-conjonctivale profonde d'eau salée à dix pour cent.) *La Clinique Ophtalmologique*, 10 juin, 1908.
- 10 Domec. — Remote results of the treatment of progressive myopia by pressure-massage. Rules to be observed in the application of this treatment. Quelques résultats éloignés du traitement de la myopie progressive par la massage-pression. Règles à suivre dans l'application de ce traitement.) *Bull. et Mém. de la Société Française d'Ophtalmologie*, 1908, p. 508, and *La Clinique Ophtalmologique*, 25 juin, 1908.

- (11) Abadie, Charles.—Clinical and therapeutical considerations regarding sympathetic ophthalmia. *Annales d'Oculistique*, juin, 1908.
- (12) Lewis, F. Park.—Blindness following the injection of protargol in lacrymal sac. *Ophthalmic Record*, June, 1908.
- (13) Darier, A.—Iodate of soda and secondary glaucoma. (Iodate de soude et glaucome secondaire.) *La Clinique Ophtalmologique*, 10 juillet, 1908.
- (14) Troussseau, A.—Spas and seaside resorts in the treatment of eye diseases (Les stations hydro-minérales et marines dans le traitement des affections oculaires.) *La Clinique Ophtalmologique*, 25 juillet, 1908.
- (15) Darier, A.—Serum therapy of eye infections. (Sérothérapie des infections oculaires.) *La Clinique Ophtalmologique*, 25 juillet et 10 et 25 août, 1908.
- (16) Zimmermann, W.—A contribution to the question of Deutschmann's serum therapy. (Contribution à la sérothérapie de Deutschmann.) *La Clinique Ophtalmologique*, 25 septembre, 1908.
- (17) Harren.—On the treatment of lime-burn opacities of the cornea by means of ammonium preparations. (Zur Behandlung von Kalktrübungen der Hornhaut mit Ammonium-Präparaten.) *Centrallbl. für prak. Augenheilkunde*, November, 1908.
- (18) Sylla, Bruno.—Ethylmorphin iodid : a new dionin preparation. (Das Aethylmorphiniodid : ein neues Dionin-Präparat.) *Wochenschrift f. Ther. u. Hygiene des Auges*, 7 Januar, 1909.

(1) **Hirschberg** (Berlin) relates a case of a lady of 50 who had always been myopic, and who one day received a blow in the right eye ; following this a fine moveable veil was noticed, which gradually got better, and then suddenly, three weeks after the accident, the eye became blind with the formation of a thick veil in front of it. On examination, the whole upper half of the retina was found to be detached, and in the lower half of the detachment a wide tear was found ; small hæmorrhages in the vitreous ; T.—3 ; and great tenderness. Treatment was by rest in bed and potassium iodide internally. After six weeks no improvement was noticed, and patient was discharged. A month later there was a remarkable improvement, and in the course of the following three months the eye became practically well, the only thing being that the field of vision upwards did not extend beyond 40°.

A. LEVY.

(2) **Hesse** (Graz) gives a list of 23 cases of *ulcus corneæ serpens*, treated by the method of passive congestion. In these cases this was the only curative procedure adopted except for the use twice daily of atropine. In 18 cases the result was perfectly good ; the process came rapidly to an end and the scarring was mild. In 3 cases no benefit resulted from the treatment, and other methods were employed, but the usefulness of the eyes was lost. In 2 cases, complicated by suppuration in the lacrymal sac, the process healed only after the sac was extirpated. Attention is drawn to the fact that the final scarring after this method is much finer and less obvious than after ordinary methods, especially the cautery. The apparatus employed is a glass cylinder from which the air is exhausted, the eyelids being kept open.

A. LEVY.

(3) **Fejér** (Budapest) reports a case of embolism of the central

artery of the retina cured by the immediate application of massage. The patient, a man, aged 52, was seen within three hours of the onset of the embolism. There was the characteristic cherry-red spot at the macula; vessels were very small; retina generally was edematous. The eye was at once tied up. Potassium iodide was administered internally, and the eyeball massaged in a circular manner. For three days there was no change, but after that, vision gradually returned. Within three weeks he saw 5/20, and eight weeks later 5/5 and J.L. There was concentric contraction of the field of vision to about 30°, which also disappeared, leaving him, finally, with a contraction below of only about 15°. To be of any service, the massage must be carried out immediately, or within a few hours of the onset of the embolism—that is, while the clot is still soft and easily broken up. A. LEVY.

4. **Caspar** (Mülheim) saw a woman, aged 51, one hour after the sudden onset of blindness. Ophthalmoscopically, embolism of the central artery was found. The eye was cocainised and massaged in a circular direction three times for two minutes each time. Next morning, patient could count fingers at $\frac{1}{2}$ metre and by the evening $V.=1/60$; three days later $V.=1/5$, with a large defect in the field downwards. Gradually, most of the vessels became filled with blood, and at the end of a month $V.=2/5$, and the scotoma below was only relative. Vision subsequently improved still further. A. LEVY.

5. As the result of an experience of about a dozen cases, **Denig** (New York) advocates paracentesis of the anterior chamber in inflammatory affections of the uveal tract. The operation lessens pain, shortens the duration of the inflammation, and clears up the vitreous. It may be repeated, if necessary, twice a week. SYDNEY STEPHENSON.

(6) **Krauss** (Philadelphia) reports argyrosis of the conjunctiva after the use for 20½ months of a 20 per cent. solution of argyrol prescribed for the cure of a purulent dacry cystitis. The remedy was applied twice a day. The local discolouration is stated to have greatly diminished since the argyrol was discontinued. This last observation is important, since, as well-known, argyrosis from silver nitrate is permanent. SYDNEY STEPHENSON.

7. This is a concise *résumé* of **Salmon's** work published in *Annales de l'Institut Pasteur*, janvier, 1908. It does not bear specially upon ophthalmology, except in so far as the special toxicity of atoxyl is concerned. Koch has shown (*Deutsche med. Woch.*, 14 November, 1907), that eye lesions appear after repeated injections of 1 gramme of atoxyl. Injections of 50 centigrammes do not, according to Koch, determine optic nerve atrophy. Of course, where a lesion of retina or optic the nerve exists, atoxyl ought not to be employed. Without deciding absolutely as to the dosage and number of injections necessary in a case of syphilis, the author suggests that 50 centigrammes is the necessary and sufficient one, and that it is not toxic. It is, however, a maximum dose. It should not be progressively increased in amount. Atoxyl is not to be regarded as in any sense a substitute for mercury and iodide, but as a useful alternative to these drugs.* ERNEST THOMSON.

8. In this short article **Kroemer** pleads for full treatment by tuberculin of ocular tuberculous lesions. As soon as a local tuberculous condition shows some improvement, one is apt to be content with such a partial result. But the cured focus is only a symptom of internal tuberculosis; the treatment should combat, not only the local lesion, but the general affection. The complete cure of a tuberculous individual is a fact of considerable importance in the war against tuberculosis. The oculist can take his share in this social

* Note.—An article by DUBOIS, 'On Atoxyl in Ocular Syphilis,' appeared in *THE OPHTHALMOSCOPE*, Vol. IV, 1907.

war, if he is careful to push his treatment to finality and not merely to the disappearance of an ocular affection which is, after all, but a symptom.

ERNEST THOMSON.

(9) **Villard** (Montpellier) after injecting salt solution into the upper part of Tenon's capsule (probably) found at the first dressing that there was ptosis. This remained complete for five days, after which the paralysis gradually disappeared and became cured in about a fortnight. The author considers that the affection was due to a transitory neuritis of the nerve-endings in the levator palpebræ muscle.

ERNEST THOMSON.

(10) **Domec** (Dijon) insists, as he has done before, that a properly followed-out course of pressure-massage arrests the progress of myopia by causing improved nutrition of the eye through the periodical improvement of the circulation of fluids, i.e., the tension is reduced by the massage. The details of the method and the case-histories should be sought in the original communication to the *Société Française d'Ophthalmologie* or in *La Clinique Ophthalmologique*.

ERNEST THOMSON.

(11) **Abadie's** article is essentially a plea for the adoption of the newer methods in dealing with sympathetic ophthalmia, present or apprehended. A hopelessly injured eyeball, or one that has produced sympathetic disease, should be sacrificed unconditionally. Not so, however, when the exciting eye still retains some sight, together with its dimensions and shape. Under such circumstances, all points of the original wound should be thoroughly searched with the galvano-cautery, and the loss of substance thus occasioned be covered in with conjunctiva, held in place by sutures. Such intervention is sometimes sufficient to prevent the onset of sympathetic mischief, but should the latter develop, we must employ mercury by inunctions and subconjunctival injections. If the worst comes to the worst, we can still enucleate. Observations have now multiplied to show that intra-orbital injections of sublimate, seldom exceeding in strength 1:1,000, may succeed in curing a sympathetic ophthalmitis that has refused to yield to enucleation and mercurial inunctions and subconjunctival injections. When sympathetic mischief has developed, and the patient refuses enucleation, we may make injections into the eyeball of one or two drops of a 1:1,000 solution of corrosive sublimate, as recommended by Abadie many years ago.

SYDNEY STEPHENSON.

(12) In the case reported by **Park** (Buffalo, New York) cellulitis of the orbital tissues and blindness from interference with the optic nerve speedily followed the injection into a suppurating lacrymal sac of about tcc. of a 2 per cent. solution of protargol. Five years later, the optic disc was blanched, and perception of light was absent. Such an accident is, of course, an exceedingly uncommon one.

SYDNEY STEPHENSON.

(13) Subconjunctival injections of iodate of soda were first recommended as an analgesic by Schirle in 1903. **Darier** (Paris) has found this salt in subconjunctival dose of 1 milligramme to have a wonderful effect in secondary glaucoma. It reduces tension and relieves pain. Iodide of potassium has no such effect, and in one case where it was tried it caused increase of tension. The tension became normal after stopping atropin and injecting iodate of soda. In cases of irido-cyclitis with exclusion of the pupil, iodate of soda quiets the eye and permits iridectomy to be performed. It is a useful alternative to dionine when tolerance of the latter has become established. Darier looks upon this salt as a specific for secondary hypertension. In primary glaucoma it does not always do good, and sometimes provokes an acute attack. Eleven case-histories are related.

ERNEST THOMSON.

(14) **Trousseau** (Paris) premising that certain spas are capable of doing

harm in particular eye affections, even though the general health be improved, gives a list of such resorts on French soil, it may be said, which are suitable for certain conditions. One finds it difficult to believe that it is possible to parcel out the available places among the different diseases in such a precise way.

ERNEST THOMSON.

(5) **Darier** Paris has written so frequently on the subject of serum-therapy that one may be excused for dealing rather briefly with what is a very readable and, needless to say, an enthusiastic article on the subject. The text will be found at the very end of it and reads as follows: "While waiting for specific sera for each infection, the practitioner will do well, at the first sign of infection, to employ antidiphtheritic serum, which is the most energetic of all nonspecific sera and obtainable at every chemist's." Darier admits that the value of Roux-Behring serum in infections other than diphtheritic was revealed to him "by the purest empiricism." But the fact remains, it will cure infective corneal ulcers and leave a less extensive leucoma than any other treatment; if taken early, infective wounds of the eyeball will heal with wonderful rapidity after three or four injections of 100 c.c. of Roux serum; threatened panophthalmitis can be stayed off with it; and, most important of all, post-operative infections, if taken in hand early, will yield to it. Furthermore, in one case of severe iridocyclitis in an eye which had remained well for more than a year after cataract extraction, the infection, endogenous in origin, was arrested after four injections in six days. The author offers an explanation as to why antidiphtheritic serum should have a "heteroalant, heterodox, or paraspecific" action, but for this and for details of cases reference should be made to the original. Certain accidents from the use of serum must not be forgotten; such as exanthemata and transitory albuminuria. From 2 per cent. to 3 per cent. of individuals are subject to them. Darier refers to the opinions of von Hippel, Napp, and Zimmermann regarding Deutschmann's serum and to those of English authors regarding Wright's antistaphylococcic vaccine.

ERNEST THOMSON.

(6) **Zimmermann** (Gorlitz), in view of the differences of opinion as to the value of *paraspecific serum therapy* as practised in France by Darier and others (with the serum of Roux), and as to the efficacy of Deutschmann's serum-therapy as practised in Germany, and severely criticised by von Napp, thinks the time has come for the publication of results by the various practitioners who have tried the methods. He cites cases where Deutschmann's serum was used alone, *i.e.*, without cauterization and so on, and concludes that in spite of somewhat meagre results, the method should be employed, because it seems to do well in a certain number of cases. Notably, its good effect is incontestable in pneumococcus infection. On the other hand, in a case of streptococcal abscess of the cornea it seemed to do actual harm. Zimmermann does not consider that von Napp's observations are conclusive.

V. von Hippel published, just at the same time as von Napp, a paper on the utility of Deutschmann's serum in various eye affections which is of a nature to convince the most sceptical. The question, therefore, deserves further study.

ERNEST THOMSON.

(7) **Harren** describes three cases of lime-burn of the cornea treated by ammonium preparations, and in two of these cases, one, an early case, treatment began on the fifth day, and by the end of three months V. had risen from 1/60 to 1/5, and the opacity remaining was so fine as to be only discernible by means of the *loupe*. A second case was that of a man who three years ago had a severe lime burn, and later several of a less severe type. V. hand movements, five weeks treatment of this eye improved the vision to 3/5, when patient ceased attending. The treatment consists in the use of

ammonium tartarate (neutralized) in 10 per cent. solution, applied to the eye by means of an eye-bath. The application should last from 15 minutes to an hour, and should be repeated two or three times daily. At first especially it is very painful, and cocaine 2 to 5 per cent. may be employed, not only to make the application more tolerable, but also the action of cocaine in raising the epithelium is advantageous, as it enables the solution to reach the line deposits more easily. This is a method well worth trying in cases where the nebula has not become too cicatricial.

A. LEVY.

(18) **Sylla** (Bremen) after $3\frac{1}{2}$ months' trial of ethyl morphin iodide finds that salt to be as active as dionine hydrochloride, and to possess certain advantages over the latter. It is soluble in water to the extent of 4 per cent., but Sylla prefers to apply the powder direct to the eye. He appears to attach considerable importance to the therapeutic value of the iodine constituent of the new remedy.

SYDNEY STEPHENSON.

BOOK NOTICES.

Meyrowitz Bulletin. By E. B. MEYROWITZ, 104, East 23rd Street, New York, U.S.A. No. 35. December, 1908.

A glance at the *Meyrowitz Bulletin*, a publication perhaps better known on the other side of the Atlantic than in this country, will repay ophthalmic surgeons. Amongst the novelties described and figured, one may mention the Sutchiffe keratometer, Well's phorometer, the illuminated Berger binocular loupe, the instruments employed by Major Smith for extracting cataract in the capsule, Worth's advancement forceps, Hirschberg's capsule forceps, and new capsulotomes by Post and Valk respectively. Pigments for tattooing the cornea are now supplied in several hues, as green, black, yellowish-brown, yellow, ultramarine, yellowish-red, and medium and dark brown. The colours are stated to contain no harmful ingredients. A new material for the handles of eye instruments, described as "a special fibre composition," is mentioned, and stated to be unaffected by boiling or by any of the solutions used for sterilization. An account of Gervais' eye charts and of Head's fundus charts is included in the *Bulletin*.

The British Optical Almanac for 1909. London: Offices of "The Optician and Photographic Trade Journal," 123-5, Fleet Street, E.C. Price, One Shilling.

The *British Optical Almanac* contains a good deal of information likely to be both interesting and useful to ophthalmic surgeons. For instance, it is convenient to know the regulations that govern the examinations and the diplomates of the Worshipful Company of Spectacle Makers, and it is interesting to observe that the only member of the medical profession whose name is unblushingly advertised as a member of the Board of Examiners is that of "Mr. G. Lindsay Johnson, M.A., M.D., M.Sc., B.Sc., F.R.C.S." The examination in visual optics and sight-testing, it is announced, is conducted "by ophthalmic surgeons." Who these surgeons are does not transpire, but perhaps that does not matter much. Discretion is sometimes still the better part of valour. Here are the exact words of the regulation which prohibits diplomates of the Worshipful Company from using such

1892 as atropine. "XIII. That he will not administer any drug for the purpose of testing the sight, nor test the eye whilst under the influence of drugs, and no such drugs have been administered by or under the direction of a Medical practitioner." The latter part of this regulation implies a slur upon some members of the medical profession, which we have reason to believe is not wholly unjustified. A really useful feature of the *Almanac* is the report of the Optical Standards Committee on the standardisation of trial cases, reviewed in THE OPHTHALMOSCOPE of September last by Mr. W. A. Dixey. It may still be news to some readers that the verification of boxes of trial lenses is now undertaken by the National Physical Laboratory, Teddington, on payment of a fee. The *Almanac* also contains a very practical little article on "Some data of Optical Calculations." Another useful feature is to be found in a list of symbols and abbreviations in use by oculists and opticians.

The Change undergone by the Refraction in the Different Periods of Life (Over de verandering der refractie gedurende den loop van het leven). By F. H. DUBOIS. Thesis for the degree of M.D., Utrecht, 1908.

In general, oculists cannot follow the course run by the refraction during the entire life of their patients. Yet it would be a thing of great value to have certainty about the question how normal eyes behave themselves all through life. It is generally said that we are born hypermetropic, to be emmetropic in our best years, and in old age hypermetropic again; but this opinion is not based upon well-established facts. Dubois was able to get information about the eyes of a great number of normal people in different stages of their lives. In Holland, since 1883, all the railway employes are examined as to their eyes, first when they enter service, and, again, at the age of 45, and from that age they are re-examined every five years. In 1877 there was a general examination of all the employes then in the service. The reports of these examinations are carefully kept. All these examinations are made in the same way, namely, refraction is estimated with glasses, without the use of cycloplegics. So the material from which Dubois has drawn his conclusions was a very uniform one, and the best possible source for an accurate knowledge of the refraction of the same persons in different periods of life. His results were as under:—

It is to be regarded as a well-established fact that the refraction of normal emmetropic eyes changes into hypermetropia later in life. This is already perceptible before the age of 45, but only at 60 reaches 0.5 dioptre, increases slowly till at 70 1.5 D. of hypermetropia is reached. In most cases there is no change of refraction after 70 years.

G. F. ROCHAT.

The Medical Inspection of School Children. A series of lectures reprinted from *The Medical Officer*, 36-38, Whitefriars Street, London, E.C.1. Price 4s. net.

This *brochure* of 62 pages contains a series of lectures on various aspects of the medical inspection of school children, delivered at the West London Post-Graduate College, and reprinted from *The Medical Officer*, a journal for medical men in the Government and Municipal services. For the short section dealing with eye, Mr. Kenneth Scott has made himself responsible. He deals with the usual subjects: errors of refraction, inflammations of the eye, trichiasis, strabismus, and so forth, in a more or less conventional way, as was

perhaps inevitable under the circumstances. Errors of refraction should be estimated under the influence of a cycloplegic, and the work "should be confided to some qualified physician or surgeon, who alone is competent to carry out the examination under a mydriatic, and the services of the self-styled 'sight-testing optician,' acting in his commercial capacity, must be rigorously excluded." Mr. Scott remarks that even the poorest child can now obtain spectacles through one of the numerous philanthropic agencies that exist in London—"The practical routine method of doing this is to send the poor person to the local clergyman." It is advised that the relative visual acuity of children under six years of age be not estimated, because children of such tender age "do not know the alphabet sufficiently to make the tests dependable." This rule appears to be perhaps a little absolute, for some intelligent children under six know their letters quite well and many others can be tested with dots, figures, or some of the numerous so-called "illiterate" types. Scott recommends that the windows of class-rooms should be on one side alone, so as to avoid confusing cross-lighting. This plan has met with the approval of some authorities on school hygiene, but obviously it interferes with one important condition of a healthy room, namely, cross-ventilation. Indeed, windows on one side only would seem to require some method of artificial ventilation. The compromise of large (lighting) windows on one side and of much smaller (ventilating) windows on the other would almost certainly be preferable. In Scott's opinion, term examinations should be abolished, and home preparation be done away with.

SYDNEY STEPHENSON.

Maladies de l'Œil (Diseases of the Eye). Fascicule XVII du Nouveau Traité de Chirurgie, publié sous la direction de A. le Dentu et Pierre Delbet. Par ALBERT TERTON, ancien interne des hôpitaux, ancien chef de clinique ophtalmologique à la faculté de médecine de Paris (Hôtel Dieu). Avec 142 figures intercalées dans le texte. Paris: Librairie J. B. Ballière et fils, 19 Rue Hautefeuille, pres de Boulevard Saint-Germain. 1909. Price, 9/50 francs.

This book is one of the volumes of a treatise on surgery by various authors, and is written for the use of general practitioners rather than of ophthalmic specialists. Terton states that he has endeavoured to describe in it what every doctor should know with regard to the diagnosis and treatment of diseases of the eye without attempting to go deeply into the consideration of refraction, ophthalmoscopic lesions, or the various forms of amblyopia. In consequence, he has produced a work which differs considerably from the ordinary handbooks, in which a considerable amount of interest centres around the omissions. Generally speaking, a perusal of the book leaves the impression that there is something wanting at both ends. The reader is evidently expected already to have some knowledge of the subject, as one misses, without regret, all reference to the optics of the eye, and the usual anatomical and physiological sketches are also absent, while for all details of fundus conditions the reader is advised to consult one or other of the recognised ophthalmoscopic treatises or atlases, and frequent references are made to monographs for particulars as to uncommon conditions.

Throughout the book the ætiology, symptoms, and prognosis of the various conditions are well described, and there are numerous brief historic notices which add to its interest. The treatment recommended by the author is clearly indicated, and the operations are, as a rule, well described, but hardly with such accurate detail as it would be advisable to give anyone proposing to perform them. Quite a number of old familiar lid operations are "scrapped"

as unjustifiable relics of a former age, while as a contrast in dealing with the iris, the author lets his well-known passion for minutiae master him and describes corelysis, synechotomy, iridotomy, irido-capsulotomy, irido-sclerectomy, iritocectomy, iridodialysis, iridectomy, and sclerectomic iridectomy.

A separate section is devoted to diseases of the caruncle, in which Terson takes a sort of paternal interest, as he claims to have discovered that it in reality belongs to the skin rather than to the eye. The various forms of conjunctivitis are classified as secreting, vegetating, and eruptive, a division which seems to be open to many objections. In dealing with purulent dacryocystitis which has resisted treatment by probing, destruction of the sac by the thermocautery is recommended in preference to excision, except in encysted cases.

In the section on glaucoma, an attempt is made to balance the claims of the theories ascribing the causation of the condition to hypersecretion and to defective excretion, but it is rather a shock to one's insular prejudice to come across an article on the subject in which the name of Priestley Smith is not even mentioned, while the operations of Holth and Herbert are wholly ignored, although that of Lagrange is mentioned as on its trial.

The illustrations are not a strong point. Their reproduction could easily be improved, and some of them are even misleading.

Taken as a whole, the book gives an account of ophthalmic diseases which is sufficient to enable a medical practitioner, with a previous grounding in the subject, to recognise and to treat the commoner external affections, and to obtain such a knowledge of the more complicated conditions as would enable him intelligently to co-operate with a specialist in dealing with them.

R. J. COULTER.

Lehrbuch der Augenheilkunde (A Text-book of Diseases of the Eye).

By Prof. AXENFELD, assisted by Professors BACH, BEILSCHOWSKY, ELSCHING, GREEFF, HEINE, v. HIPPEL, KRÜCKMANN, PETERS, and SCHIRMER. Jena: Gustav Fischer. 1909. Price 14 Marks (bound, 15 Marks).

The Graefe-Saemisch *Handbuch* supplies a detailed and encyclopedic account of our knowledge of ophthalmology, and does so in the only form in which such a mass of information could be presented to the profession. The best students' text books have approached the subject in another way, and those which have had the greatest vogue have been the work of one, or, at most, two, men. A collective attempt on the part of some of the best ophthalmologists in Germany to produce a text-book for students, especially when that attempt is directed by so able a pen as Prof. Axenfeld's, will be received with great interest by everyone who is concerned in the teaching of the subject. Until now collaboration has failed to produce anything which is equal to the single-handed effort of Prof. Fuchs, and as the work under consideration approximates his in size, a comparison of the two is inevitable, and on the result of that comparison the reputation of this new work must rest. It has, therefore, a high standard to surpass. Let us see, then, what collectivism can do. The scheme of the work is good, although perhaps more space could have been given to refraction, and the book thereby made of greater utility. The first chapter, which deals with the drugs, dressings, and apparatus in common use, is very practical and valuable. The methods of examination and testing the eye are followed by a chapter on refraction, perimetry, and malingering, which latter is more fully treated of than usual. The errors of muscle-balance should have been discussed by the author of the chapter on refraction. Refraction is dismissed so shortly that one must suppose that the student

possesses a separate book on this subject. How many will agree with the following: "People who wish to avoid alternating between two pairs of glasses, and who must at their work see both near and distant objects, can have one eye corrected for distance and the other for close vision?"*

Dealing with myopia and its treatment, Prof. Heine is at home in a subject on which he is entitled to speak with authority. He says "full correction is not a panacea, but when it is associated with rational hygienic measures, it is one of the best measures for preventing the advance of myopia." When, however, he allows himself to suggest tenotomy of the internal rectus as a method of treatment, we feel that the practical value of his opinion is lowered.

The universal regional classification of the diseases is followed, and the various chapters are, on the whole, extremely well written. That on diseases of the lacrymal apparatus suffers—to English readers, at any rate—from the writer's indefiniteness with regard to the indications for the extirpation of the lacrymal sac. No account of this subject will guide the student in his practice unless it takes up a clear attitude on this question.

The diseases of the conjunctiva are very carefully considered, the classification of conjunctivitis being well balanced between a purely symptomatic and a bacteriological one.

Elschnig's chapter on the cornea is one of the best; but here, again, small matters detract from its value. It is hardly conceivable that such a well-marked disease as keratitis punctata superficialis should have been overlooked; but there is not a word about it. The whole group of the diseases affecting the corneal epithelium (herpes, dendritic ulcer, etc.) is dismissed without an attempt at their diagnosis, and with the merest indication of their treatment. Ulceration of the cornea is very well treated of, and especially the *ulcus corneæ serpens* is concisely and ably described. Perhaps the difficulties met with in some of the corneal diseases which do not run quite the usual course could have been more fully discussed. It is doubtful if a practitioner who has to deal with a severe case of herpes zoster, and may be uneasy at the duration for months of the accompanying iritis, will be enlightened when told that "iritis is a frequent complication of this disease." The clinical description of iritis in the chapter on the uvea by Krückmann is one of the best that any text-book contains; along with the particularly fine and appropriate illustrations, the clinical appearances are most carefully described, and the difficult question of differential diagnosis handled in a masterly way. Unfortunately, here again the treatment is unsatisfactory. The student is told that eserine may be used in a case of cyclitis, when the tension rises, to open out the angle of the chamber which has become closed by the previously-administered mydriatic. No information is afforded as to what he should do if this is not successful, and the possibility of a paracentesis is not even considered.

The anatomy of the lens is well described, and the chapter, as is usually the case in text-books, resolves into a discussion of cataract and its treatment. We find all the usual remarks on extraction, arranged in a way which will commend itself to most. In a work edited by Axenfeld it is surprising that the value of taking a culture or a smear before extraction is not even mentioned. The difficulties which, even under the most favourable circumstances, will crop up in extracting, are not sufficiently fully discussed; it would go hard with some patients if the operator was not more fully equipped against accidents than this book would have him.

The presentation of an adequate record of our knowledge of retinal diseases, with their pathology, in a readable form is very difficult. Prof. Greeff has done

* Such a method has been advocated in selected cases by Percy Dunn (*THE OPHTHALMOSCOPE*, Vol. 6, 1908, p. 82).—EDITOR.

his part well, and if he has put down more information on each page than most of his readers will be able to assimilate, he certainly has succeeded in giving them a full and comprehensive review of the whole subject. By putting ophthalmoscopic differential diagnosis at the commencement, the retinal diseases in the middle, and the plates of the fundus at the end, the study of the whole subject is not made especially easy; but there is nothing but praise to be given to the text of the article on the retina, and that on the optic nerve is likewise very excellent.

Under the heading of wounds of the eye we have much valuable and practical information well arranged, but the use of X-rays as a means of localization of foreign bodies in the globe, should at least be mentioned in any text-book which aspires to be a guide to modern ophthalmic practice. Prof Schirmer pins his faith to localization with the sideroscope, an excellent instrument, but one which is only of limited applicability, and of much less exactness than the cross-thread localizer. This omission is a serious one and should be remedied.

Sympathetic ophthalmia is given the importance which it deserves, and the traumatic portion of the work concludes with a *résumé* of the practice in Germany with regard to compensation for accidents of the eye, a matter which is now of much greater importance to English surgeons than formerly. The concluding articles on the orbit and general diseases in relation to the eye present a frequently-neglected chapter in a manner which brings out the essentials without unnecessary complication, and make an agreeable *finis* to the whole work.

As a whole, the book is disappointing. It does not realize the object of furnishing a safe text-book for the student. For the teacher of ophthalmology it will be of great value, but a certain amount of discrimination will be necessary in reading it. Unfortunately, the illustrations cannot be approved of, for although the drawings of the iris in the chapter on iritis are equal to anything that the most critical eye could wish, some of the photographs are beneath contempt. It is a pity to see under-exposed, badly-developed, and indifferently reproduced photographs dragged unnecessarily into the text. The publishers are not to be congratulated on the coloured plates of the fundus, of which the colouring is crude and most of which convey a poor impression of the reality. The plate of the normal fundus does not represent a fair average eye, and the others convey the idea of very rough sketches, not the finished picture which is usually found in a publication. The proof-reader has not been very careful, but the general aspect of the book is good.

There is an index in which eight diagnostic incursions revealed one omission and one false reference.

ANGUS MACNAB.

CORRESPONDENCE.

THE STANDARDIZATION OF TRIAL CASES.

The National Physical Laboratory,

Bushy House, Teddington, Middlesex.

January 23rd, 1909.

To the Editor of THE OPHTHALMOSCOPE.

Dear Sir,

As you are probably aware, we have, at the request of the Standards Committee of the Optical Society, made arrangements here for testing trial

THE OPHTHALMOSCOPE, February, 1899.



Yours ever
D. Argyll Robertson

cases, and are now in a position to issue certificates on the lines laid down in the Report recently issued by the Optical Standards Committee.

The question of the fee to be charged for the work is a somewhat difficult one, and it is hardly possible for us to come to a final decision until we have had more experience with trial cases actually sent in for test. At present we propose, for the more complete cases, containing upwards of 250 glasses, to make a charge of 30s., and a smaller charge, dependent on the amount of work involved, for cases containing fewer glasses. This arrangement must, however, be regarded as provisional and subject to revision after further experience has been gained.

It is hoped that such certificates, ensuring the accuracy of the glasses within practically useful limits—the permissible error in power is limited to about 2 per cent.—may be of value to the users of trial cases.

I may add that the certificate given would be to the effect that the glasses in the case were accurate within the limits indicated in the Report I have referred to.

In some instances it might be desired, for a few standard glasses, that the actual value should be given to as high an accuracy as possible. This would, of course, involve more labour in making the measurements, and for such work the charges I have suggested would not apply.

Yours very truly,

R. T. GLAZEBROOK, *Director.*

OBITUARY.

DOUGLAS MORAY COOPER LAMB ARGYLL ROBERTSON,
M.D., LL.D., F.R.C.S.Edin., F.R.S.Edin.

BORN 1837—DIED 1909.

By the death of Argyll Robertson, which took place while on a visit to the Thakur of Gondal, India, on January 2nd, at the age of 72 years, ophthalmology has sustained a well-nigh irreparable loss.

Argyll Robertson sprang from a distinguished medical stock, his father, Dr. John Argyll Robertson, having occupied the presidential chair of the Royal College of Surgeons of Edinburgh in the year 1848. Argyll Robertson received his education, both preliminary and medical, in Edinburgh, St. Andrews, and on the Continent. In 1857 he took his degree in medicine at St. Andrews, and five years later became a Fellow of the Royal College of Surgeons of Edinburgh. From the first he devoted his attention exclusively to ophthalmic medicine and surgery, a choice in which he was doubtless influenced by his father's example, for the elder Robertson, although not a specialist, took a particular interest in diseases of the eye. It was not long before the name of Argyll Robertson came into prominence. In 1863 he published a pioneer communication in the *Edinburgh Medical Journal* on "The Calabar Bean as a New Ophthalmic Agent," which had much to do with the general adoption of physostigmine as a mode of treating glaucoma. In December, 1869, a communication from his pen—"Four cases of spinal myosis with remarks on the action of the light on the pupil"—was published in the *Edinburgh Medical Journal*. In that brief and modest contribution was

described a symptom now familiar the whole world over as the "Argyll Robertson pupil." Here is the original description of the phenomenon:—"Although the retina is quite sensitive, and the pupil contracts during the act of accommodation for near objects, yet an alteration in the amount of light admitted to the eye does not influence the size of the pupil." Robertson thought that in such cases the cilio-spinal nerves were paralyzed. Argyll Robertson was the first surgeon to recommend trephining of the sclera in certain cases of glaucoma (*Ophthalmic Hospital Reports*, Vol. VIII, p. 404). Other communications included "A case of Diphtheritic Ophthalmia (1870); "On Albuminuric Retinitis" (1871); "Tenotomy of the Superior Rectus" (1873); "A new Operation for Ectropion" (1883); and, lastly, "A case of Filaria Loa" (1896).

From 1867 to 1870 Argyll Robertson was assistant surgeon in the ophthalmic department of the Edinburgh Royal Infirmary, William Walker being then the chief. In the last-named year he was appointed ophthalmic surgeon, and after Walker's retirement in 1882, Robertson, in conjunction with G. A. Berry, took charge of the department until his own superannuation in 1897. He was for several years lecturer on diseases of the eye in the University of Edinburgh. As an operator, he was *facile princeps*, and it was a liberal education in itself to witness the tact and dexterity with which he removed a cataract from the eye of a nervous or refractory patient.

For many years Argyll Robertson held the post of honorary surgeon-oculist to her late Majesty Queen Victoria in Scotland, a position which he retained in the Scottish Court of King Edward VII. In 1886 he succeeded Dr. John Smith as President of the Royal College of Surgeons of Edinburgh. Other distinguished offices filled by Argyll Robertson included the presidency of the Ophthalmological Society of the United Kingdom (1893-1895), of the International Ophthalmological Congress (1894), and of the Ophthalmological Section of the British Medical Association (1898).

In 1896 the University of Edinburgh conferred upon Argyll Robertson the honorary degree of Doctor of Laws.

In 1904 Robertson, who suffered from a pulmonary affection, decided to retire from the cares and responsibilities inseparable from a large private practice to the more genial climate of the Channel Islands. He settled at Mon Plaisir, St. Aubins, Jersey. On the occasion of his leaving Edinburgh he was presented by his medical brethren with his portrait painted by Sir George Reid, R.S.A., and was entertained to dinner by the Cap and Gown Club, of which he was a member. Robertson's retirement, however, did not cause him to abate his interest in ophthalmology, for he still continued to attend congresses in Edinburgh, London, and elsewhere. His last public appearance was in Sheffield at the annual meeting of the British Medical Association in July last.

In many ways Argyll Robertson was an admirable Crichton. Tall, handsome, travelled, popular, courteous, an accomplished linguist, and an acceptable chairman, he had always been a notable athlete. Not so many years ago he was one of the most prominent amateur golfers. He was a member of the Royal Bodyguard of Scottish Archers, one of the most ancient, honourable, and exclusive corporations in the United Kingdom. In 1882 Argyll Robertson married the fourth daughter of Mr. W. M. Frazer, of Findrach and Tormavein, Aberdeenshire, a charming lady well-known in Edinburgh society. There is no family

The following appreciation of Dr. Argyll Robertson has been contributed by his old friend **Sir Anderson Critchett, Bart.**:—

For nearly forty years I enjoyed the friendship of Argyll Robertson, and I know only too well that his loss will leave a void which no other personality can fill in the hearts of all who loved him. The handsome intellectual head and splendid frame once seen could never be forgotten, for he was the ideal representative of well-balanced mental and physical vigour. The watchwords of his life were courage, duty, and honour, and he possessed in a marked degree that old-world courtesy of manner which is too seldom to be found in this age of hustle, advertisement, and self-assertion. Those who were present at the International Ophthalmological Congress held in Edinburgh under his presidency in 1894 will recall the blended dignity and geniality with which he controlled the meetings, and the generous hospitality extended to one and all by his fair partner and himself.

In more recent times he was asked to preside at meetings during similar Congresses held at Utrecht and at Lucerne, and we his colleagues rejoiced to see him occupy that exalted position, for we felt that Great Britain could not possibly have a grander or more efficient representative.

He was an exceptionally brilliant and successful operator, fertile in initiation and resource, possessing that firm yet gentle power of manipulation which begets such perfect confidence in the patient, while those who watched his skilful operations might well exclaim in the words of his gifted countryman "the hand of Douglas is his own!"

The only occasion within my knowledge on which he hesitated to face the surgical situation was when it became necessary to operate on his brother, the late Dr. Lockhart Robertson, for cataract, and I felt much honoured when he asked me to relieve him of the fraternal responsibility.

It would be impossible to find a more perfect example of the *mens sana in corpore sano*, for with his great intellectual power and deep scientific knowledge, he combined a love of manly sport. He was an excellent shot, he belonged to the Archers of the Royal Body Guard, and his wife's most cherished ornament was a necklace formed of the numerous gold medals he had won at golf.

Although he could show unflinching firmness and force of character when the occasion demanded those qualities, he was never happier than when in genial companionship, he could throw off the fetters of professional responsibility, and heartily join in the fun and frolic of the moment.

He had a keen sense of humour, and I shall never forget the leonine roar of mingled appreciation and reproach with which he received my suggestion that it was far better to be an Argyll Robertson pupil than to have one. I sincerely hope that his sorrowing friends and former students may be able to provide some permanent memorial of this great and good man, either in connection with Edinburgh University or with the Ophthalmological Society of the United Kingdom; but the splendid work which he has done has already placed him in the ranks of the immortals, for he has left a reputation and a name which cannot die.

ANDERSON CRITCHETT.

The following notes are by **Mr. Simeon Snell**, President of the British Medical Association:—

I gladly accede to the request of the Editor of THE OPHTHALMOSCOPE to say a few words respecting my esteemed friend, the late Dr. Argyll Robertson,

whose death must have come as a deep personal loss to many. I think I must have known him for something like twenty-five years, and have been the recipient of many kindnesses at his hands. His striking and impressive personality was familiar to all of us, his courteous and dignified conduct as Chairman was shown, not only when presiding over the Ophthalmological Society, but also as President of the International Ophthalmological Congress when it met in Edinburgh in 1894. I only saw him operate on one occasion, when he performed extraction of cataract in an exceptional manner. What struck me particularly was, at a time when all were not as careful of the instruments as they are at the present day, that he was most scrupulous as to every detail. For my part I am not likely ever to forget the kindness he showed me during the past year. He early wrote to me expressing the pleasure he felt that I was to occupy the post of President of the British Medical Association, the first time, as far as these islands are concerned, that an ophthalmic surgeon has filled that position, and he stated his intention of leaving his retirement in the island of Jersey to come to Sheffield to support me by his presence, which he accordingly did, and took an active part in the meetings of the ophthalmic section. He also attended and supported me at the luncheon I gave at the Royal Infirmary to ophthalmic surgeons visiting Sheffield. This was on many accounts a most memorable occasion; besides Sir Henry Swanzy, the President of the Section, among my guests were Prof. Fuchs, of Vienna, and Prof. Axenfeld, of Freiburg, and others well known amongst us, numbering 50 in all. The presence of two veterans lent especial interest to the occasion, these being Mr. Pridgin Teale, my greatly respected old master, and Dr. Argyll Robertson, whose loss we are now mourning. He accompanied the party to the ophthalmic wards and operating theatre, and here an incident occurred which is worth the telling. After the others had left, he returned to speak to the sister in charge of the wards, saying that he was glad to hear she had worked so long with me and hoped she would continue to do so for many years; everything was in such perfect order that he felt sure it must give me great pleasure to have one working with me so long and so well. Needless to say that this, so characteristic of the man, has been treasured as a sort of red-letter day in her memory.

Always bright, always courteous, his fine, handsome appearance made him a most noticeable figure in the social functions of the meeting. Apparently in the best of health, and keenly interested in all that was going on, no one would have thought he was so soon to be removed from us. To Mrs. Robertson goes out the warmest sympathy in her deep sorrow.

SIMEON SNELL.

Sheffield,

January, 1900.

Dr. George Mackay, ophthalmic surgeon to the Edinburgh Royal Infirmary, has contributed the following notes:—

I sadly avail myself of the opportunity of adding some personal reminiscences of my old chief Argyll Robertson, with whom for more than twenty years I was intimately associated.

I had it from his own lips that though his father practised as a surgeon, and as an ophthalmic surgeon in Edinburgh, he died before his son was able to join him in professional work, and his family were left poorly off. Discussing one day with Dr. Robertson the pecuniary difficulties which confront a young specialist unsupported with private means, he surprised me by the remark that no one could realise that better than himself, for he had something less

than three figures as his patrimony when he decided to start practice as an ophthalmic surgeon in his native city. The venture was all the more hazardous because at that time the public recognition of specialism was scarcely assured, and not a few general practitioners were strongly opposed to it. I doubt whether the experiment could have been successful if he had not for a time acted as assistant to the late Professor Hughes Bennett, and under his auspices Argyll Robertson was the first to teach practical physiology in the University of Edinburgh. That, however, was not to be his career. He soon became attached to the Eye Dispensary of Edinburgh and to the ophthalmic department of the Edinburgh Royal Infirmary, and devoted himself to clinical work.

My earliest personal recollections of Dr. Robertson go back to the summer session of 1882, when he lectured daily at Surgeons' Hall. Instruction in eye diseases was not at that time a compulsory part of the medical curriculum. It was extra-mural and optional, but no serious student failed to attend it. Its voluntary character was not an unmixed advantage to the lecturer, since it secured for him not only a more attentive audience, but also left him greater freedom in his method of dealing with the subject. Dr. Robertson's systematic lectures actually provided a fuller course than is required by the present regulations. His lectures were delivered from very full, if not complete, notes, and spoken rather deliberately. Needless to say, the best of order and discipline was maintained. I cannot recall any rowdiness or levity in that class-room.

The opportunities for clinical instruction in the Royal Infirmary at that time were scarcely equal to the systematic part of the course. As the usual curriculum only extended over four years, senior students had great difficulty in finding time to attend extra classes, and my contemporaries will recall how in endeavouring to avail ourselves of such opportunities as existed for studying "specialities," we led the strenuous life, and the best attended ophthalmic clinics were those which Dr. Robertson held upon Sundays.

Many an Edinburgh graduate who does not now profess to know much about "eyes" can never forget the handsome physique, the finely chiselled features, and the dignified presence of the lecturer in ophthalmology. He carried about with him an unmistakable air of refinement. In his voice, his gesture, and his attire there was a characteristic note of distinction.

A fine artistic sense enabled him to accomplish many things neatly and well, and he was not unconscious of it. One might even venture to say that he satisfied the Scottish requirement of having "a guid conceit o' himself," without descending into vanity.

Again and again I have heard old students refer to him as their *beau-ideal* of a courteous clinical surgeon. Sympathetic and kindly in his mode of addressing the poorest patient, he did not hesitate roundly to scold the careless or inattentive parent or guardian where procrastination, neglect, or abuse of remedies had aggravated a malady, or imperilled the eyesight of the sufferer.

In those days tying up the eyes for fear of cold, and the frequent application of poultices made of decomposable material were commonly practised by persons not only without, but within, the profession, who should have known better. Against all such "abominations" Argyll Robertson stoutly protested, and I feel certain that the comparative rarity with which such cases now present themselves in the clinique to which I have succeeded is largely due to his good influence. In cases where counter-irritation seemed indicated, a favourite remedy of his (and of his predecessor, Mr. Walker) was the application of solid nitrate of silver to the moistened outer surface of one or

other eyelid. His skill as an operator was universally acknowledged. He was not only dexterous, but taught us to be ambidextrous. By the time I was associated with him he had adopted Listerian methods of antisepsis, his favourite germicide being a solution of perchloride of mercury. He occasionally horrified some of us, whose training was more modern, by placing the ivory handle of a Graefe's knife or an iris repositor between his lips as a convenient resting-place in the middle of an operation; but he committed the outrage with such quiet dignity that one scarcely ventured to protest, and, after all, his results were excellent. It astonished some of his students latterly that he did not assist his vision with spectacles at operations, but he was anisometropic, the right eye emmetropic, the left myopic. For external examinations he commonly employed a small magnifying glass before the right eye.

As the late Professor Jowett observed:—"We are none of us infallible, not even the youngest of us," and Argyll occasionally made mistakes like the rest. An old friend of mine, a Highland gentleman, once consulted him about some ocular discomfort. I know not whether it was his grey-bearded visage and Highland cloak, with perhaps an odour of Harris tweed which suggested to the mind of Dr. Robertson, not merely the "mountain and the moor," but some partiality for "mountain dew," but the patient was hugely diverted when the consultant concluded his examination by gravely shaking his head, raising his finger, and saying:—"That whisky, that whisky!" The diagnosis had certainly gone astray, for my informant was a total abstainer. In general, one was impressed by the soundness of his judgment, his retentive memory, and his vast experience.

To his wholesome love for manly exercise, his success as a golfer, an archer, and a curler I need not further refer. But I cannot conclude these brief notes without endeavouring to express the sense of profound sorrow with which the news of his passing away has been received by all with whom he was associated in the city and the land which he adorned. The sympathy of all who knew him goes out to the bereaved wife, to whom he was so devotedly attached. He leaves behind him the precious memory of an honoured name and an inspiring example of professional life and conduct.

GEORGE MACKAY.

EDINBURGH, *January, 1900.*

The following appreciation of our late colleague has been furnished by the *deputy* of German ophthalmologists, **Professor H. Sattler**, of Leipzig:—

I was grievously affected to learn of the unexpected death of Dr. Argyll Robertson. Although he has left us, yet his memory will be indelibly inscribed in the annals of medical science. His name is inseparably connected with the pupil phenomenon, so important as regards the early diagnosis of *tubercles dorsalis*. This discovery alone would confer immortality upon his honoured name.

To all who had the good fortune to be more intimately acquainted with Argyll Robertson, the impression of his noble figure and his genial personality will never fade.

German ophthalmologists unite with their British brethren in deploring the loss of Argyll Robertson. The German Ophthalmological Society was proud to count him amongst its members. On several occasions he attended the meetings at Heidelberg.

Visitors to the last five International Congresses of Ophthalmology had the pleasure of meeting Argyll Robertson, who on several occasions occupied the presidential chair. For the latter distinction his accomplishments, his tact,

his sympathy, and his earnestness rendered him especially suited. By the inexorable disposition of fate we shall grievously miss Argyll Robertson at the Naples Congress which will be held shortly.

The day of Argyll Robertson's death is one of gloom, not only for his colleagues in Edinburgh, but for all who knew him.

Leipzig,

H. SÄTTLER.

January, 1909.

NOTES AND ECHOES.

Deaths.

WE regret to announce the death of Dr. Chauvel, who assisted the elder Galezowski for many years in the direction of the *Revue d'Ophthalmologie*. He was a Member of the Academy of Medicine, and a Medical Inspector of the French Army. Among American ophthalmologists the following has recently died: Nelson B. Covert, of Geneva, N.Y.

* * * *

Appointments.

F. MENTEITH OGILVIE has been appointed consulting surgeon, and P. E. H. Adams, assistant surgeon, to the Oxford Eye Hospital. Henry Hanna has been appointed assistant surgeon to the Ulster Eye, Ear and Throat Hospital, Belfast, Ireland. N. B. Harman has been appointed permanent assistant medical officer in charge of the ophthalmic clinic of the Education Committee of the London County Council. Bietti has been appointed Director of the eye *klinik* in Cagliari, Sardinia. Wilhelm Krauss, assistant in the University of Marburg, has been accorded the title of professor in the University of Marburg. A similar distinction has been bestowed upon Dr. Wolfgang Stock in the University of Freiburg. G. Herbert Burnham has been placed in charge of the new eye clinic, instituted at St. Michael's Hospital, Toronto, Canada. Newbold Jones and H. A. McCullough have been appointed assistants. J. G. de Rock has been appointed House Surgeon to the Royal Eye Hospital, Southwark, S.E. F. Antill Pockley, lecturer on ophthalmology in the University of Sydney, and ophthalmic surgeon to the Royal Prince Alfred Hospital, has been elected President of the next Australasian Medical Congress, to be held in Sydney in 1911. Dr. Beauvois, editorial secretary of our contemporary the *Revue d'Ophthalmologie*, has been nominated an officer of public instruction. Dr. Houdart, of Brest, has been nominated *Chevalier de la Légion d'Honneur*.

* * * *

A Guy's Hospital Romance.

A MARRIAGE has recently taken place between Herbert Eason, ophthalmic surgeon to Guy's Hospital, and the Honourable Miss Bingham, eldest daughter of Lord Clanmorris. It appears that some two years ago the Honourable Miss Bingham entered Guy's Hospital as a probationer, with the intention of completing her full three years' course, but Hymen has stepped in and changed the lady's intentions. Best congratulations to Mr. Eason! By a curious coincidence Miss Bingham is cousin to another well-known ophthalmic surgeon.

* * * *

We have heard something on this side of South African methods, and believe that the expressive word "slim" originated from that faction-torn country. We must confess, however, to a feeling akin to consternation on observing the following paragraph in the November issue of the *Transvaal Medical Journal*:—

"Messrs. Nelson and Co., optologists, have moved their Pretoria branch to more convenient quarters on the ground floor of 220, Church Street. They claim that being specially trained for, and giving their whole attention to eye work, they are more expert than those who merely add the sale of optical goods as a commercial side line to some other business. One of the members of the firm is now permanently resident in Pretoria, and thus always available instead of twice a week as heretofore."

Our dismay was not diminished by the fact that the journal in question purports to be "published under the auspices of the Transvaal Medical Society." In this case we venture to suggest that the Medical Society would be well advised to exercise a little stricter control over the reading columns of our enterprising, if indiscreet, contemporary.

* * * *

THE Oxford Ophthalmological Congress will be held **The Oxford Congress**, this year on July 14th, 15th, and 16th, and Keble College will be available for those who attend the meeting. As on former occasions, there will be one or more addresses, but the work of the Congress will mainly consist of demonstrations—clinical, pathological, and operative. Every facility is offered by Mr. R. W. Doyne, Reader in Ophthalmology to the University, to those surgeons who desire to contribute to the demonstrations. On the other hand, communications and discussions are not invited, since it is felt by the organizers of the Congress that the ground in those directions is already fully occupied. Mr. Doyne is prepared to reserve beds in the Eye Hospital for any gentlemen who desire to bring patients to Oxford, in order to demonstrate new operations or methods. A number of prominent Continental surgeons will, it is expected, attend the Oxford meeting.

* * * *

THE following is taken from a recent number of the **Medical Heroism**, *Daily Mail* Paris edition:—An unassuming act of self-sacrifice on the part of a young medical student, M. Louis Bazy, has just secured for him the Cross of the Legion of Honour. M. Bazy, who is the son of a well-known French surgeon, was assisting his chief in a Paris hospital. During an operation a quantity of virulent matter suddenly escaped from a wound into M. Bazy's eye. The only hope of saving his sight was for the eye to be immediately treated, but this would have necessitated leaving the operating table and abandoning the operation, with probably fatal consequences to the patient. The young man without a moment's hesitation told his chief to proceed with the operation, and he did not disinfect his eye until the work was over and the patient safe. A few days later it was found that the eye was infected, and after six months of great suffering it was found necessary to remove it. President Fallières, hearing of the incident, immediately decided that young M. Bazy should be decorated. The President said he desired to show that the wound received by a doctor attending the poor was no less glorious than the injury sustained by the soldier on the field of battle.

**The Scottish
Optologist.**

THE Scottish optologist appears to be even more astute in his business-methods than his brother south of the Tweed, if we may judge from an advertisement emanating from a firm of Glasgow opticians. The firm in question offered upon a certain day in December last to test the eyesight, and to supply spectacles free of charge "to all respectable employees, householders, or members of their families who require glasses." The philanthropic firm goes even farther. "If, after testing," so continues the advertisement, "we find it necessary for any person to consult an oculist at any of the Eye Hospitals, we will give a card which will enable that person to have the glasses made by us free of charge . . . according to the prescription obtained at the Hospital." The advertisement achieved at all events one of its ends. So large a crowd collected about the opticians shop that the footpath was blocked all day, and police regulation was eventually called for. Not to be beaten, an American Optical Company, with premises in Glasgow, advertised their ability to straighten cross-eyes "without the knife," as well as to cure cataract, and made other claims of a like nature. The following was an even more curious claim: "Your eyesight is too precious to be tampered with (*etc!*) by any but the most expert." Truth will sometimes out, even, as it would seem, in a particularly blatant commercial advertisement!

* * * *

**From Colliery to
Conjunctiva.**

INDEED, just now Bonnie Scotland is very much to the fore in matters ophthalmological, as witness the following from a recent number of the *Medical Press and Circular*:

The latest piece of quack-booming comes from Scotland, where one William Miller is extolled as an "eye-doctor" of marvellous powers. Like the bone-setter Rae, this pretentious individual is a miner by trade, and if there is any excuse for becoming a quack, we think, perhaps, the prospect of earning a living above ground, instead of in the bowels of the earth, is the most plausible. To this degree of affluence Miller seems not to have attained, but, thanks to the publicity given to him, no doubt he will in time. As it is stated that fifty to sixty patients, drawn from the upper classes of the neighbourhood, visit him on Saturdays and Sundays, it is difficult to see why he cannot make a very comfortable living; a good many medical men would be satisfied with that number a week, even if they only paid half a guinea a head. When we come to Miller's claims as to treatment, we confess to having less patience with him, for he holds out to cure cataract, ulceration, "dirt tumours," "fire," and "that ungainly inflammation so often the residue of measles." Without pretending to know what fire and dirt tumours are, we may safely say that any unqualified man who holds himself out to cure this list of diseases should be amenable to the criminal law, as the suffering which unskillful and uninstructed "treatment" may cause in the eye is conceivable only by those who have experienced it.

* * * *

Moorfields Hospital.

IT is announced that the third annual dinner of the students (past and present) of the Royal London Ophthalmic Hospital, will be held on Wednesday, February 10th, at the Trocadero, London, W., under the presidency of Sir Anderson Critchett, Bart. Tickets (price 10s. 6d. exclusive of wine from the honorary secretaries, Messrs. A. Lawson and J. H. Parsons.

* * * *

Amalgamation
Redivivus.

THE question of amalgamation (or is it absorption?) between the Royal Society of Medicine, on the one hand, and the Ophthalmological Society of the United Kingdom, on the other, is again to the fore, as predicted in these columns several months ago. A special meeting of the Ophthalmological Society has been called for March 12th, in order to consider the question, and the Council has issued a memorandum on the subject which is distinctly favourable to amalgamation. In view of the attitude of the Council, as shown in the memorandum, it is rather futile to be told that "in order to leave the final decision freely in the hands of the society," the Council "decided to pass no resolution either *pro* or *contra*." It is somewhat difficult to see how the "final decision" could be left in hands other than those of the general body of the members of the Society.

* * * *

As most readers are aware, the late Mr Harry Barnato The Barnato Bequest, left a legacy of £250,000 for the purpose of building, equipping, and endowing "a home, hospital, or other charitable institution." Amid the clash of conflicting claims made for this handsome sum, one may hope that those of ophthalmology will not be altogether overlooked. In England at the present moment, although ophthalmology is well taught clinically at more than one institution, yet there exists no machinery for teaching either to students or to post-graduates the scientific basis of the subject, neither does the pathological aspect receive the attention it assuredly deserves, except in one or two notable instances. In other words, in England there is no serious attempt to teach ophthalmology in all its bearings, probably as the direct result of the official neglect of ophthalmology by a majority of the examining boards. Ophthalmology may still be described as "the poor sister" of the medical sciences, despite its enormous advances and the debt under which it has laid general medicine and surgery. It will be remembered that the University of Oxford recently discussed the question of conferring a diploma in ophthalmology upon medical practitioners after due and proper examination in the special subject, and the University is now actively engaged in maturing the scheme. This advanced step on the part of the oldest British University will necessitate the expenditure of a considerable sum of money for the full development of the scheme. A grant from the Trustees would be a singularly happy way of perpetuating the name of Barnato.

* * * *

La Clinique
Ophtalmologique.

DR. LOUIS DOR, of Lyons, has joined the editorial staff of *La Clinique Ophtalmologique*, the journal conducted by Dr. Darier with conspicuous ability. By the way, we observe that with the New Year the periodical in question has been issued in more attractive form. The change is all for the better, since, truth to tell, the old style was a trifle cumbersome.

THE OPHTHALMOSCOPE.

A MONTHLY REVIEW OF CURRENT OPHTHALMOLOGY.

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MARCH 1, 1909.

TWO SHILLINGS.

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ORIGINAL COMMUNICATIONS.

OPTIC NEURITIS IN CEREBRAL TUMOURS*

BY

LESLIE PATON, B.A., M.B., F.R.C.S.,

ASSISTANT OPHTHALMIC SURGEON TO ST. MARY'S HOSPITAL, LONDON, AND TO THE
NATIONAL HOSPITAL FOR PARALYSIS, QUEEN SQUARE, LONDON.

THE subject I have chosen for this lecture is variously named optic neuritis, choked disc, or papillitis; and I believe that the nomenclature is unfortunate, for all three names imply a pathology which, at the present time at least, we are not fully justified in believing to be true. The terms optic neuritis and papillitis imply that the process is inflammatory, and such a pathology has not yet, at any rate, been proved. The term "choked disc" also implies a pathogenesis for which we have as yet no definite proof. The name "papilloedema" has been suggested as one likely to meet those objections, but it also, I fear, suffers from a serious objection in being cacaphonic.

I limit myself on this occasion to a discussion of the process as it occurs in connection with cerebral tumours. First, I may discuss the changes as they appear in their earlier stages, a question of some importance, as careful observation of the earlier stages may throw light on the pathogenesis. The first appearances of any disturbance in the disc consist of blurring of the upper and lower margins of the disc. This blurring tends to spread round the inner margin, so that three-fourths of the disc edge is often completely buried in swelling, while the outer sector remains fairly clear and defined. Coincident with this early blurring, there is a congestion of the veins, and I have not yet been able to convince myself that the venous congestion precedes the blurring; in fact, in a certain number of cases I have been fairly sure that there was no venous congestion, obvious, at any rate, to ophthalmoscopic observation, when the blurring of the edges was quite well-marked. As the process goes on, the outer sector and the physiological pit also become involved in the swelling. And with the vascular congestion, numerous little vessels, which normally are not apparent, become visible, giving the swollen disc a striate, "juicy" appearance. By this time the congestion of the veins has become a very definite feature, and shows itself in tortuosity. I do not think that the arteries at this early stage are in any way changed in calibre, certainly I do not think they are constricted. Ophthalmoscopically, the swelling at this time is obvious by the bending of the vessels at the edges of the swelling, but, of course, is most obvious by the difference in the measurement of the top of the swollen disc, and the measurement in the retina, some distance away from the disc. Now, there are one or two precautions which must be taken if our measurements of disc-swellings are to be in any way regarded as accurate. First, in regard to measuring the disc: it is not a good practice to measure a large swollen vein, although this may be the most obvious thing on the surface of the disc. It is best to take for the measurement some of the smaller vessels at the most swollen part of the disc. Then, as to the retinal measurement, it must be remembered that the swelling in many cases spreads some distance

*A Lecture delivered at the Polytechnic, London, W.C., on January 26th, 1909.

from the normal disc edge into the adjacent retina, and this oedematous condition may, and frequently does, spread as far as the inner edge of the macula. Consequently I would suggest that the best place for measuring the retina is just beyond the macular area. And we find here tiny terminal arterial branches coming towards this part from the upper and lower temporal arteries, which provide very suitable objects for measurement. When the neuritis has reached its full development, there are frequently haemorrhages of various sizes scattered round the outer margin of the swelling. These haemorrhages occur in about 50 per cent. of all cases, and are not, I think, to be regarded as necessarily indicating a very severe neuritis, but rather as indicating a particular condition of blood or blood-vessel in the patient under observation. Macular figures, however, when they develop, I regard as being of much greater importance, as indicating severity of the neuritis. Now these macular figures occur in 15 per cent. of all cases of optic neuritis in cerebral tumours, and if we take the average swelling of all cases of optic neuritis in cerebral tumours as being 4.5 D., the average swelling in cases with macular figure is 5.1 D.—that is 0.6 D. higher than the general average. The macular figures are an expression of the overflow of oedema, mainly in the nerve-fibre layers. They usually are fan-shaped, with the point of the fan reaching nearly, but not quite, to the macula. The number of spokes in the fan varies from 8 to 20, and I would ask you to note that these macular fans are definitely elevated above the general retinal level. As an example of this, in a case I saw comparatively lately, the top of the disc was measured with +7 D.; the general retina beyond the macula was +1.5 D. and the area of the macular fan, that is, the area between the disc and the macula, was measured with +4 D. The macular figures are found more frequently in connection with cerebellar tumours than in tumours of any other region. But they may occur in connection with tumours in any part of the brain.

Liability to Neuritis in Tumours of Different Parts of the Brain.

It is to be recognised that tumours in some parts of the brain are very much more frequently associated with optic neuritis than are those in other regions. I have been recently investigating a large number of cases from this point of view. 80 per cent. of all cases of cerebral tumour develop optic neuritis in varying degrees of severity. The remaining 20 per cent. pass to their final stages without showing any optic neuritis. Now, there are certain sites in connection with which we may say that optic neuritis is certain to develop. All cases of cerebellar tumour get optic neuritis; all cases of temporo-sphenoidal tumour get it; practically all cases of ventricular tumour and tumour of the optic thalamus and mid-brain get optic neuritis. The exceptions to these latter two types are those in which the pressure is so directly on the chiasma, that a pressure-atrophy develops instead of a neuritis. The majority of cases of parietal and frontal tumour develop optic neuritis, and the majority of extra-cerebellar tumours also get optic neuritis. **The great bulk of the cases which do not get optic neuritis are pontine and subcortical tumours, i.e., tumours in the white matter of the cerebral hemispheres.**

First of all, then, with regard to the pontine tumours. Over 40 per cent. of these cases show no neuritis, and the cases which do develop neuritis only do so when the tumour has spread, so as to involve the neighbouring structures, more especially the cerebellum. In other words, we may say that pontine tumours, as such, do not get optic neuritis; when it is present in them it is only in virtue of involvement of the neighbouring structures, especially the cerebellum.

As to subcortical tumours the question is a little more complicated. But to enter into a full discussion of this would occupy more space than I have at my disposal. I may say, however, that subcortical tumours, so long as they remain limited to the white matter, do not get optic neuritis, and that the development of optic neuritis in these cases coincides more frequently with the spread of the tumour to the basal nuclei, than with its spread to the cortex in the regions of the vertex. As to the severity of the neuritis when it does occur, it is most severe in tumours of the cerebellum, the pons, the optic thalamus, and mid-brain; and it is least severe in parietal and subcortical tumours.

The nature of the tumour itself seems to play a very small part in determining the incidence of the neuritis. Unfortunately, in the case of certain types of tumour the numbers of cases available are too small to allow me to make any very definite generalisations. But to take as an example, the one type of tumour of which we have a considerable number of cases, glioma; here we find that 20 per cent. of cases of glioma had no neuritis—in other words, a percentage exactly corresponding with the general percentage of all tumours without optic neuritis. I will modify my statement, however, as to the nature of the tumour having no influence in determining the neuritis to this extent: *in so far as the nature of the tumour may determine the site of the tumour, just so far will it determine the incidence of neuritis.* For example, tuberculous tumours are much more frequent in the cerebellum and in the mid-brain than in other parts of the brain; and we find, therefore, tuberculous tumours are very frequently associated with neuritis. Then, fibromata are nearly all extra-cerebellar tumours growing from the 8th nerve, and pressing up on the pons and cerebellum. Fibromata are nearly all associated with optic neuritis. On the other hand, the number of malignant tumours, such as sarcomata and carcinomata, which have no neuritis, is distinctly above the average. And here we should expect there would be more tendency to breaking down of the brain substance, and consequently a greater development of toxins. Yet we find that the percentage of cases with neuritis is lower.

I must shortly discuss a very vexed question, namely, **the question of the homolaterality of the neuritis.** In other words, does the neuritis tend to develop earlier and to be more marked in the eye corresponding to the side on which the tumour develops? I know that my views on this question are regarded as heterodox; but if I can show that a definite, even although it be a small, percentage of cases show an earlier or a greater neuritis in the opposite eye, I think it must make us a little doubtful of the advisability of utilising this sign as indicating the side of operation, in the absence of any other localising symptoms.

For this purpose, we must only include cases which have been watched through the various stages of the neuritis. We must not accept measurements from cases in which there are any signs of commencing subsidence or atrophy in one eye or the other. And the differences must be sufficiently great to be outside the limits of observational error. This, of course, limits the number of cases available for statistical purposes. But I have records of 102 cases which meet these requirements. In 53 of those cases the difference in swelling between the two eyes did not amount to more than 0·5 of a diopter—that is to say, the swelling was practically the same in both eyes. In 25 cases the swelling was greater in the eye corresponding to the side of the tumour, and in 24 cases the swelling was greater in the contralateral eye. Not only was this so, but in quite a definite number of cases the neuritis had developed while the cases were under observation. In 30 cases was this so. In 13 of them the neuritis commenced practically simultaneously in the two eyes. In 11 the swelling commenced

first in the contralateral eye, and in 6 it developed first in the homolateral eye. But further than that, there were 4 cases in which the neuritis appeared in only one eye at any period in the history of the tumour; and in each of those 4 cases it was the contralateral eye which showed the neuritis.

In concluding, I wish to suggest as a possibility, worthy, at any rate, of serious consideration, that the affection of vision which takes place in cerebral tumours is not, of necessity, the result of the affection of the nerve-head, which we call optic neuritis. I put this forward in a somewhat tentative fashion, but there are several reasons for regarding the visual loss and the papillary oedema as more or less independent of one another. It would take me too far to go into those regions at present in detail, but I may say that in a paper which I read some time ago before the Ophthalmological Society* I pointed out that attacks of temporary amaurosis were frequently seen in the early history of cerebral tumours, and that these attacks were not necessarily associated with optic neuritis; that many cases of optic neuritis passed through their whole history, from commencement to complete subsidence, with little or no visual affection; that, on the other hand, in many cases after operation, recovery of vision took place at a very much more rapid rate than the subsidence of the neuritis. There are other reasons which might be adduced in favour of this view which I suggest, but time will not permit me to give them in detail. The practical importance of it, however, I think is this: I regard the loss of vision, certainly in many cases, as being due not so much to the oedema of the nerve or nerve-head, as to the direct pressure of a distended ventricle on the chiasma. And if this is so, I think it will point to our taking this precaution, that if operation has to be performed in cases of cerebral tumour in which no definite localisation can be made, in other words, **if a palliative trephining has to be done with a view to saving vision, the time to do it is not necessarily on the first development of the neuritis, but on the first signs of visual failure manifesting themselves.**

CASES OF RETRO-BULBAR OPTIC NEURITIS.†

BY

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THE subject of optic neuritis, always interesting, has recently taken on an added importance. Most of us have had to bear the pain of watching a choked disc swell before our eyes, come to a standstill, slowly decline, become pale, and ultimately whiten, ourselves filling the patient meanwhile with mercury or iodide, and bitterly regretting our impotence at the same time because we felt we had done all that was possible. But things have changed in these latter days. Sir Victor Horsley¹ thus writes as a summary of his present position in relation to this subject:—

"1st. That all cases of optic neuritis should be relieved as soon as possible by operative treatment."

"2nd. That such operative treatment, in the absence of other indications, should be the opening of the subdural space in the temporal or subtentorial region."

* *Trans. Ophthalmological Society U.K.*, Vol. XXVIII, 1908, Fasc. ii. For abstract see *THE OPTHALMOLOGIST*, 1908, p. 620.

† Read before the Ophthalmological Section of the Southern Medical Association at Atlanta, Georgia, U.S.A., November 11th, 1908.

"3rd. That the physician or surgeon in charge of a case must be held responsible for consequent blindness if the neuritis be not treated *as soon as detected*".

His reasons for taking up such a position are "that optic neuritis is produced by a combination of factors, of which the only one we know to be certainly present is a rise of intracranial tension or pressure," and that his experience in cerebral operations (which has been very great) has taught him that the operation is practically unattended by risk, that it is of immediate and remarkable value in saving sight, and that, sometimes, even when atrophy has progressed some distance.

It need hardly be said that Sir Victor Horsley is the last man to have made such assertions of every form of optic neuritis, and he clearly states, before entering upon the substance of his paper, that he means "all forms of papillitis which accompany a new growth or inflammation" within the skull.*

But the very advance which his words indicate throws a new anxiety on us who are responsible for the treatment of optic neuritis, because a considerable proportion of one's cases recover without operation. It is well, therefore, in considering optic neuritis, to bear this class of case carefully in mind. In order to illustrate it, I have selected from among my own cases of optic neuritis, occurring in private practice, the records of such as appear to belong to that variety which is known as retro-bulbar, omitting, among other causes such as intra-cranial lesions, those due to trauma, to Leber's hereditary atrophy, and to the so-called toxic amblyopias, which statement however, is not intended to imply that some of the cases noted may not have been due to auto-intoxication.

Synopsis of Cases.

Case.	Age.	Sex.	Eye.	Result.
I R.L.M.	30	M	L	6 6
II P.P.	10	F	B	6/9
III M.P.	13	F	L	6/9
IV J.H.N.	16	M	L	6 9
V J.W.S.	39	M	B	6 9
VI T. (?)	30	F	R	6 6
VII S.G.	7	M	B	6 5
VIII C.J.	18	M	B	6 4
IX J.W.	19	M	L	6 36 = Still under treatment and improving.

CASE I. R.L.M., aged 30. Factory Superintendent. July 10th, 1897. Patient's vision good till five days ago when bitten on the conjunctiva of the left eye by a spider. A week previously had shot a spider with the left eye. The morning after the bite, the sight of that eye was misty. The vision of the right eye was found five days after the bite to be $\frac{5}{5}$ of the left $\frac{6}{60}$ when looking 3 feet above the object. The right eye was normal. The left pupil reacted to light, but slowly; the fundus was normal. The R.F.V., taken by the perimeter, was full, no scotoma; the left was considerably contracted, with a large central scotoma. It reached from 15° on the nasal to 30° on the temporal side, and was roughly oval. The patient was congenitally colour blind. He complained of no pain; he smoked very little; there was no history of syphilis; he had not been exposed to bright light; and there was no albuminuria. Lacetles were ordered, together with calomel and Donovan's solution. Improvement was rapid, and twenty-three days later L.V. was 6 6 partly, the left field was full, the perimeter showed no scotoma, and the fundus was still normal.

It is possible, though unlikely, that the spider had something to do with the neuritis. The apparently sudden onset, the absence of papillitis, and the complete, or almost complete, recovery, will all be noted.

* Rabinow and Chailionis, Frankel, and others have had good results also from lumbar puncture, the operation generally having to be repeated.

CASE II.—P. P., aged 17. March 20th, 1868.—The patient's father writes to the following effect. "After going into the family history, which contains nothing of importance, he says that the first attack was in June, seven years previously, when "vision suddenly impaired, almost totally blind in R.E. Pain in back part of eyeball, nausea, photophobia; consulted Dr. — who said there was no disease of the eye; the trouble was congenital. Dr. — consulted, diagnosed neuro-retinitis. Treatment pilocarpine and potas. iodide. This treatment kept up for several months. Vision gradually improved till almost restored."

"Second attack about the same time the following year. Symptoms and treatment same as in former attack. Result same. Vision in each eye so impaired that glasses were used for past three or four years."

"Third attack March 16th, six years later. Pain in left eye, at the back of the ball. Neuralgia in left temple over eyeball extending to right eye. Consulted Dr. — who said there was slight congestion of optic nerve. Treatment: hot applications, which gave some relief. March 19th examined eye again, and said there was no trouble in the eye. Diagnosis: neuralgia."

The case came under my care on March 29th, or thirteen days from the onset of symptoms. The patient stated that three days previously L.V. became veiled, there was still pain behind the eye and the ear. Now R.V. = 6/60 with glasses; usually, she states it was 6/18 with glasses (2.5 D. sph.). R.F.V. contracted all round to about 35°, no scotoma for white or colours. L.V. — Fingers at two metres when held below, where she appears to distinguish also large squares of red or green. The perimeter showed a concentric contraction to some 30° and a relative scotoma not involving the macula but semilunar in shape, to the temporal side, some 10° wide lying between 5° and 20° circles on the chart, and bordered by a layer of indistinct vision. There was pain in pressing the L.E. backward and also on movement to right and downward. Both discs were considered to be perhaps abnormally pale outward. Salicylate of soda and potassium iodide were ordered. March 31st.—Still painful on looking in any direction, but pain in rest of head gone and no pain on pressure. Four leeches prescribed. April 2nd.—Pain on pressure still absent. Pain in all directions on movement. Pupil acts well, but quickly dilates and contracts again on both sides, more markedly than normal. *White*.

Now the F.V. for white is contracted some 20° on temporal side; very little on nasal. A central scotoma passing through and including macula and including also an oval, mainly below, 15° by 20°. But beyond the scotoma out to about 30° the object was veiled. *Red*. Not recognized anywhere. When seen, it appears either as a light colour or as brown. Its outer circle on the chart was generally some 10° to 20° more contracted than that for white; the central scotoma roughly resembled that for white, but was double the size. There was one spot near the centre of the scotoma and close to the macula where red was seen, and another upwards on the temporal side in the seeing area where it was not seen. *Green*.—On the whole, somewhat less contracted than red. Central scotoma about 20° all round, inclined to be circular. It was seen as a light colour except in one small spot where it was recognized and another where it was called blue.

April 7th.—No pain on movement or pressure. Thinks she can see better, can tell red and green when held at one spot some degrees to nasal side. L.V. c. correction 6/60. Both discs pale. April 11th.—V. distinctly enlarging, and can tell yellow, green, and red three mm. size, by central vision. April 15th.—L.V. 6/60. No pain. April 19th.—L.V. 6/30. May 18th.—L.V. 6/18. Discs distinctly pale.

June 16th.—R.V. 6/60 with — 2.0 D. sph.
— 2.5 D. cyl. ax. 180° 8
L.V. 6/60 with — 2.5 D. sph.
— 0.5 D. cyl. ax. 180° 6

The patient has had no further trouble.

This is an example of those cases, which appear to be not very common, of recurring neuritis. She had three attacks, the first at ten and the last when I saw her at 17 years. A sudden and painful onset, as in her case, is not unusual. A vision in each eye of 6/60, with myopic astigmatism, after three such attacks seems to indicate a considerable recuperative power on the part of the optic nerve. The reaction of the pupil to light is interesting. In 1897 Mr. K. Marcus Gunn (¹) laid stress upon the secondary wavering and dilation sometimes seen in these cases while the light is still held on the pupil. This symptom, especially when combined with the presence of a central scotoma, may be of use in differentiating from hysteria. It will be noticed that it occurred in several of the cases here recorded, and in one of them (Case VIII) it was present after contraction to convergence, an observation which I have not seen recorded before.

CASE III.—M. P., age 13. July 20th, 1901.—Comes complaining of pain in L.E. and poor vision in R.

R.V. 6/24. H.M. 1/25, with + 1.0 D. sph.
+ 75 D. Cyl. Ax. 60° = 6/12.
L.V. 6/9 H.M. 1/10 D. ,, + 1.0 D. sph.
+ 25 D. Cyl. Ax. 60° = 6/6.

R.O.D. is paler than L. R.E. was inflamed three months ago. July 20th.—For two days pain in and about L.E. and on movement. R.V. 1/60. L.O.D. swollen (6 D.), veins large and tortuous. Oedema round O.D. No hemorrhages. Treatment: Hydrag. c. creta, Atropin. July 27th. — +7 D. focusses O.D. No albuminuria. Blister to temple. July 29th. Less pain. Aug. 1st. — Counts fingers close to face. O.D. still much swollen. Aug. 9th. Counts fingers at one foot. Aug. 12th. — Mercury stopped, as gums sore. Potassium iodide and Ammonia. Aug. 16th. Swelling now 4 D. Sept. 3rd. R.V. 3/60. Sept. 11th.—L.V. 6/9. Outer side of O.D. rather pale. Patient was then lost sight of. In this case, also, pain and papillary swelling were very marked.

CASE IV.—I. H. N., age 16. July 2nd, 1902.—Complains of weak eyes and frontal head-aches. R.V. 6/4. H.M. 0/25 D. L.V. 6/24. H.M. 1/75 6/6 partly. R. fundus normal.

L. fundus vessels small and O.D. pale. A year later. L.V. corrected 6/9 partly. O.D. very pale. L.E. V. contracted to nasal side. Knows red and green (3 mm. sq.) with central vision. Two years later. L.V. corrected to 6. O.D. the same. In this case the vision, after having recovered till it was 6/6 partly, a year later declined to 6/9 partly, and two years afterwards was 6/9.

CASE V.—J. W. S., age 30. August 4th, 1902. —For a week mist before eyes and things seem to shake. Health debilitated. Headaches recently. Never syphilis. Smokes three pipes a day, and after meals. R.V. 6/60. H.M. 2/0 D. not improved. L.V. 6/60. H.M. 2/0 D. 6/36 one letter. Veins on both O.D. a little full, and edges of O.D. rather hazy. T.n. Recognizes 10 mm. square of red and green. Potas. iodide. Aug. 20th.—R.V. 6/60. L.V. 6/18. Sept. 1st.—R.V. 6/18. L.V. 6/12, one letter with correction. Sept. 17th.—R.V. 6/12. L.V. 6/6. Sept. 20th.—R.V. 6/12. L.V. 6/6 (half). Oct. 4th.—R.V. 6/6 partly. L.V. 6/6. Dec. 31st.—R.V. 6/12. Margin of O.D. a little indistinct. Color inclined to dirty-grey. Jan. 5th.—R.V. 6/9. In this case the R.V. was better two months after the attack than it was later.

CASE VI.—Miss T., age 30. January 6, 1903. —On January 4th, when in theatre, R.E. "seemed darker" than usual. Had been purged by "Apenta." Now sees a brown spot. Positive scotoma, moving with the eye. Vision with glasses, and strong spheres and cylinders. R.V. 6/6. O.D. edges indistinct and vessels rather full. L.V. 6/6; O.D. perhaps a tendency in same direction as R. but refraction in both about 5.0 O.D. Hydrag. cum creta and Dover's Powder. Jan. 6th.—In both eyes veins enlarged; edges of O.D. indistinct, swelling of 2 D. of each O.D. Jan. 12th.—R.V. 6/6. L.V. 6/6. Jan. 15th. Has had follicular tonsillitis. V. same. Jan. 20th.—Vision now becoming normal. Patient left city at this time. I now hear from her sister that the patient recovered after some months. In the meantime an eminent New York oculist had informed her that there was nothing the matter with her except nervousness.

CASE VII.—Master S. G., age 7. September 12th, 1903. —For some days pain in eyes. Discovered a few days ago that he could not see with L.E. R.V. (pictures) about $\frac{5}{6}$. L.V. No P.I. Ophthalmoscope. R.E. pupil acts fairly smartly to light but no difference can be seen on convergence. Retinal veins much swollen, arteries also large. Edge of O.D. hazy. Seen with +2 D. Rest of fundus with +3 D. L.E. pupil does not act to direct light, acts consensually, but cannot be seen to act to convergence. O.D. swollen (+2 D.), and vessels, especially veins, very large. History.—In April had measles. In August had what the family doctor is sure was malaria no blood examination. His complaint was mainly frontal headache, and he ran about as usual, though the temperature was at times in the afternoon 103 Fahr. No vomiting. He took calomel and twelve grains of quinine each morning. Never ear or nasal trouble. He is now quite well. Eat almost too much. No cough. No lead poison. Sept. 13th. Still no pupil contraction on convergence. Hydrag. cum creta. His doctor reports no albumen or sugar in urine. Sept. 15th.—R.E. same. L.E. O.D. seen with +3 D. Sept. 17th. L.E. projection good. Hand-reflex. Sept. 21st.—R.V. going down. Fingers at two feet. L.V. = fingers at one foot. Sept. 26th.—R.V. = fingers at four feet. L.V. = fingers at two feet. Sept. 30th.—V. much the same. No pupil reaction on convergence. Oct. 5th.—R.V. = fingers at ten feet. L.V. = fingers at eight feet. Oct. 6th.—O.D.s getting pale. Oct. 10th. R.V. = fingers at 12 feet. L.V. = fingers at two feet. Strychnine and arsenic. O.D.s paling. Oct. 31st. O.D.s white. V. = same. Nov. 6th.—R.V. = fingers at twelve feet. L.V. = fingers at six feet. Nov. 27th. R.V. = $\frac{5}{6}$. L.V. = $\frac{5}{6}$. Pupils now act well. Dec. 12th. O.D.s much the same. May 11th, 1908 (four and one-half years later).—R.V. = $\frac{5}{6}$. L.V. = $\frac{5}{6}$. R.O.D. very white, but a greyish tinge on inner $\frac{2}{3}$. Vessels at least full-sized. A strong reflex for some distance round vessels, extending some way from the O.D. L.O.D. whiter even than R. Vessels of good size. No such reflex as in R. Oct. 20th. R.V. = $\frac{5}{6}$. L.V. = $\frac{5}{6}$. Nov. 4th.—F.V. (perimeter) full, with 100, white square, no color scotoma for green or red, three mm. square. Both O.D.s are very white, with hilled-up centres. On the right there is a greyish tinge to the white. Round them is a narrow mottled area. The vessels are normal, but only those of a large size are visible on the discs.

There are some noticeable points in connection with this case. The pain in or near the eyes was slight and of short duration. The vision of his left eye declined to absence of light perception and recovered to 6/5. This probably means as has been mentioned by Mr. R. Marcus Gunn that in such cases the tension on the nerve within the narrow optic canal and *pial* sheath is sufficiently great to destroy conduction, but not sufficiently prolonged to destroy the axial cylinders.

It is peculiar that the right pupil, while acting to light, should during several careful examinations, not have been seen to act to accommodation. I remember seeing a similar condition in a case of Mr. A. S. Morton's at Moorfields. This is one of the cases in which the nerve was visibly affected, the papilla having been swollen and its vessels enlarged. The ultimate condition of the discs is an exaggerated example of the pallor which is common even in those cases which recover, and which is probably due, not to an atrophy of the true

nerve matter, but rather to the laying down of a new tissue which does not contract.

CASE VIII.—Mr. C. J., age 18. August 10th, 1908. Eyes have been troublesome for years. He has been ill for a week with what his doctor considers was malaria (no blood examination). Has taken daily for six days 20-25 grains of quinine. The R. E. has pained since he became ill; he had headache at first. Vision has fallen off, and he has diplopia. No syphilis; no tobacco. Has a central, positive scotoma in each eye. Now patient looks rather white and unhealthy, though naturally of fine physique. R. external rectus does not carry the eye much beyond the middle line. The R. pupil contracts to light slowly, wavers, and then dilates again. It is rather smaller than L., which is rather bigger than usual but acts normally. The R. wavers and dilates after convergence as it does after light. R. O.D. = veins full, edge below blunted. L. O.D. = veins full. R. V. = fingers at 18 inches. L. V. 6/18. Not improved. Sees better in a dim than in a bright light. August 21st. Patient's doctor has been able to find nothing in any part of the body to account for his eye malady. Hydrag. protiod. August 26th.—Still both O.D.'s blunted. L. now more swollen than R. + 1.5 D. (+ 0.5 D. on retina). Veins large. Pupils now equal; both wobble, though contraction fairly sharp. R. V. fingers at 24 inches. L. V. 6/18. August 29th. R. V. fingers at four feet. L. V. 6/18. Sept. 1st. R. V. fingers at twelve feet. Fundi the same. Sept. 8th. R. V. 6/6 partly. L. V. 6/6. Sept. 11th.—R. V. 6/6. L. V. 6/6. R. external rectus acts much better, but there is still diplopia on looking to R. Sept. 14th. R. V. 6/6 better. L. V. 6/6. Sept. 18th. R. V. 6/5 partly. L. V. 6/5 partly. R. O.D. is now about normal. L. O.D. is a little red. Almost no diplopia. Sept. 23rd. Vision improving. Fundi normal. Sept. 26th. R. V. 6/4 partly. L. V. 6/5. Sept. 29th. Some tinnitus in R. ear. Has many adenoids. No sinus disease. Oct. 2nd. R. V. 6/4 partly. L. V. 6/4 partly. October 20th. I removed a considerable number of adenoids. Oct. 26th. No latent convergence. Perimeter, no central scotoma for green or red—three min. square. F. V. full. Nov. 6th. Not the least central scotoma for colour even at six feet. L. O.D. inclined rather to be red than pale. Upper margin rather hazy with distinct striation of retina above it. Veins perhaps full.

In Case VIII a point worthy of observation is the association of paralysis of the external rectus with pain and optic neuritis. A group of cases has been reported in which there co-existed pain and recurrent paralysis of ocular muscles, but without optic neuritis. Of these I recorded a case three years ago.⁵

It will be remembered that Case VII also was preceded by an illness which was diagnosed as malaria. The O.D.s are peculiar in not showing at this time any blanching. The fact that the vision was poorer in a bright than in a dim light is a well-recognized feature of such cases.

CASE IX.—Mr. J. W., age 19. September 10th, 1908.—Since April 1st has noticed that L.E. did not see. Vision has been getting worse since then. No pain except headaches, no illness, no trauma, no nasal or anal disease, never squinted, no reason to suspect tobacco or syphilis. R. V. 6/4 partly. H.M. 5/D. L.E. fingers at three feet. Fundi R. normal, unless outer half be pale. L. vessels normal. Out 2 3 of O.D. pale, and round it some disturbance of pigment. T.n. R. recognizes 30 mm. sq. of red and green. L. cannot see colours. Fil. Hydrag. protiod.

September 24th.—L.V. = fingers at 6 feet. L.E. does not recognize red and green by central vision, but does when the colours are held to nasal side. L.O.D. pale to outside. Pupils.—L. contracts briskly to light, then wavers and dilates slowly, but R. does the same to some extent.

Oct. 14th. L.V. 6/60. Nov. 9th. R.V. 6/4. L.V. 6/60, with .5D. av. 180 = 6 36. He has noticed that vision is better in a dim light. Perimeter L.F.V. is somewhat contracted to the temporal side. No central scotoma for white. He recognized 3mm. square of red, only a 10 mm. square of green, does not recognize a 10 mm. square of yellow. No symptoms of insular sclerosis. L.O.D. on temporal side clearly paler than R.

As this patient was not seen until 5½ months after the onset of the ocular affection, we can merely suspect that there was swelling of the papilla from the disturbance round it. I draw attention to the fact that the central scotoma, in this case, as seems to be the rule, tends to disappear before the general field has recovered.

It will be observed that, though the selection of the cases just quoted has had no relationship to their degree of improvement, all of them (except Case IX, which is still improving) recovered useful, indeed, almost normal, vision, yet we meet with cases suggestive of a *quondam* retro-ocular neuritis, which have been by no means so fortunate.

As examples of such cases I quote the following:—

CASE I.—Mrs. J. S. R., age 47. September 24th, 1897. Three years ago typhoid fever. During fever read one day, and three days later was blind in left eye, followed in three weeks by

the left eye right. Vision impaired up till three months ago. Now is troubled by a yellow glare. R.V. = 6. Fingers at four m. L.V. = 6. 12. H.M. 25 D. F.V.R. (hand) contracted all round. F.V.L. nil. O.D. both very white, but no lymph seen on them. This is probably one of the rare cases of retro-bulbar neuritis due to typhoid fever. The nerves were probably untreated, but whether that had anything to do with the unfavourable result, I should not like to say.

Case 2. Mr. H. P. S., age 22. Since measles, eight years previously, L.V. has been poor. During last three years pain in L. globe, mostly at night and from changes in the weather. Had rheumatism a year ago. R.V. = 6.6. No H.M. Not improved. L.V. = 6. 12 partly. No H.M. Colour V. good for 10 min. square. In left eye vessels rather large; centre of O.D. filled in; white ring round O.D. Lymph on vessels going on to retina.

Case 3. Mr. H. P. T., age 21. Eyes water and pain. Has known for 5 years that the vision of the left eye was poor, though he was aware of no reason for this. R.V. = 6.4 partly. H.M. 25 D. L.V. hand-reflex. The right fundus was normal; the O.D. of the left was quite white, although the vessels were of normal size, and there were the traces of some old disturbance round the O.D.

Case 4. Mr. J. W. H., age 63. R.V. c. correction 6.6. L.V. c. correction 6/36. L. old neuritis. Lymph on O.D.

Case 5. Mr. J. D., age 42. December 4th, 1903.—Since summer, aching behind eyes on movement, also aching in back. Severe pain from back of neck over ears to vertex. Vision falling off. In each eye V. with — cylinders = 6.5 partly. Veins rather full in retina, and lymph on vessels extending from O.D.s to retina.

Case 6. — Mrs. B., age 26. April 25th, 1904.—R.V. = 6/5. L.V. = 6.18 partly. Not improved. L. O.D. very grey and muddy, not white. Nothing abnormal in the retina.

Again, closely resembling this class of case, are the toxic amblyopias, of which that due to tobacco, which is primarily a retinitis, is the most common. I refrain from quoting cases, which are usually in men above middle age, remarking only that while it may be true, as has been asserted, that alcohol may be a safeguard against tobacco amblyopia, that probably depending upon the quality and quantity of the tobacco and of the alcohol, my own personal experience in the Southern States has indicated that alcohol aids and abets tobacco in causing amblyopia, although I have seen it here where alcohol was practically never taken.

To return to the cases first quoted, it is perhaps a little curious that four out of the five monocular cases should have been in the left eye.

It will be observed also that the majority of the nine cases quoted were under twenty years of age; that Case VII was only seven; that Case III was thirteen; that Case II was ten at the time of her first attack. Yet retro-bulbar neuritis is held to be very uncommon in persons as young as fourteen or even sixteen years of age.

So far as these cases go, sex appears to have nothing to do with their ætiology, but four out of the six cases which are quoted as probably unrecovered cases of retro-ocular neuritis were in men.

Mr. R. W. Doyne⁶ divides his cases into binocular, the less acute variety, of whom only two recovered out of eleven, and generally occurring, he says, in men; and monocular, with grosser changes at the beginning, mostly in women, of whom five out of his seven cases recovered.

It is to be noted that it may occasionally be difficult to distinguish acute or symptomatic retro-bulbar neuritis from the chronic form associated with tobacco, alcohol, etc.

Swanzy⁷ divided his cases thus: I—Monocular idiopathic, of which group (a) the larger, recovered. Of these, there were more than double as many females as males; the youngest was sixteen, many being over forty. In group (b) in which none recovered, females predominated again by one-third, but the average age was greater. II—Binocular cases. All recovered. Three males, two females. There was, besides, an important set of cases, not represented among my own, in which the optic nerve was attacked as part of a general insular sclerosis. These are apt to be confounded with hysteria and they have been confounded with tabes, but without reason. Buzzard

whose writings are our best authority on this subject, found pallor of the discs in 50 per cent. of his cases of insular sclerosis. The optic neuritis may be transitory, while the disease is progressing elsewhere.

A point to be noted is the early failure of vision in retro-ocular cases, which is very different from the course of intra-cranial cases, in which the vision may remain good until atrophy is setting in.

I shall not go into the aetiology of retro-ocular neuritis. In individual cases it is often obscure; but among the recognised causes are orbital cellulitis and periostitis, perhaps from the teeth or ears, sphenoidal disease, "colds" rheumatism, gout, syphilis, tubercle, insular sclerosis, and, perhaps most important of all, auto-intoxication. To these should be added malaria, and perhaps typhoid and other fevers.

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A CASE OF RECURRENT RETINAL HÆMORRHAGE IN A BOY OF 18 YEARS THE RESULT OF ? MALIGNANT ENDOCARDITIS.

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THE following case of recurrent retinal hæmorrhage seems to me of considerable interest, both on account of the unusual termination of the disease and of the difficulty in finding the cause.

F. M—, aged 14, consulted me first in July, 1901, on account of recent failure of vision. He was a thin, rather tall boy. The hands were somewhat cold and blue, but he was apparently in good health. R.V. 6/24—1.0 D. 6 5. L.V. 6 24—1.0 D. 6 5.

The patient was not seen again until July, 1904. In the interval he had resided for some twelve months in Spain, and had noticed failure of vision gradually increasing for the past twelve or eighteen months. R.V. 6 60. L.V. 6 60. Under homatropine, there was an error of—2.75 D. in each eye, which glass raised the acuity again to 6 5 in each.

In August, 1905, he again came to see me. He had been working in a bank for some months, and had noticed for the past few days that the upper part of all objects seen with the left eye was rather blurred. There was also slight distortion of straight lines as seen with this eye; they were convex towards the right. Vision was still, with correction, 6 5 in each eye. Examined with the ophthalmoscope, the left eye showed a patch of œdema, below the optic disc, spreading towards the macula. It was sharply defined and limited by a dusky red patch, probably of deep hæmorrhage. The optic disc was rather congested. The right optic disc was also hyperæmic, but the fundus of this eye showed no other change.

On enquiring into his health, he said that he had been a little out of sorts and was still anæmic. His brother (a medical man) told me that he seemed "seedy" ever since his return from Spain, and "they thought he had not been properly looked after and fed there."

There was nothing definite in his general condition which could account for his ocular changes, and I advised rest.

During the next fourteen days, during which he was seen at short intervals, the œdema gradually extended, with increase of the hæmorrhage and the appearance of fresh patches of œdema round the optic disc; and the vision of the left eye fell to 6/60. The right visual acuity remained normal. We then recommended mercurial inunction, although it was not suggested that the condition was syphilitic. The possibility was discussed, but there was no reason to think that infection was possible; the mercury was ordered in the hope of bringing about absorption of the inflammatory products before they had irretrievably damaged the retina.

On October 20th it was noted that the original patch of œdema in the left macular region, seemed to have become organised, and now suggested a mass of connective tissue, having the same outline as before but projecting forwards into the vitreous. The top was seen with a lens of $-1.0D.$, indicating a difference of level between the top and the general retina of about 0.66mm. The retina, beyond the macula, was thrown into folds and ripples radiating from the apex of the mass.

Mr. E. W. Brewerton had kindly seen F. M.— on several occasions during my holiday, and now, after another consultation between us, we took him to Mr. R. Marcus Gunn.

Then, for the first time, the right eye, which had occasionally been the subject of slight metamorphopsia, was found to show some œdema close to the disc, and a single small hæmorrhage.

At Mr. Gunn's suggestion, F. M.— consulted Sir A. E. Wright, who found the coagulation-time of the blood slightly lengthened to 2 mins. 30 secs., against a normal time of 1 min. 45 secs. He attributed the retinal conditions to the abnormal state of the blood, and recommended the use of calcium lactate, in doses of 20grs., three times a week.

At this time the visual field of the left eye, which was frequently charted, showed a small scotoma, extending from the blind spot to the macula, embracing both, and having an extent of about 25° in the horizontal and 10° in the vertical meridian.

After the calcium lactate had been taken for a week or two, there seemed to be a definite improvement. On November 11th, "no hæmorrhages seen in the right eye; those in the left eye less dense," and a few days later, "the mass in the left eye is definitely smaller and more localised. It is now a white ridge, about half a disc-diameter in its vertical diameter, running from the lower half of the outer margin of the disc outwards to the macula; the œdema of the area above this has almost disappeared." The improvement, however, was not permanent. F. M.— had been warned against any active exertion, but on the next week I noted, "rather more œdema in the left eye, and a new hæmorrhage near the yellow spot; fresh œdema on the inner side of the right optic disc, and two small hæmorrhages. Has been cycling a little." R.V. = $2.75D.$ 6/5. L.V. = $2.0D.$ 6/36.

He was advised to keep very quiet, and to limit his exercise to gentle walking. The hæmorrhages in the right eye gradually absorbed, and the connective tissue mass in the left eye underwent further contraction.

In December, the mercurials were omitted, and the calcium lactate increased, but the hæmorrhages were constantly recurring, although in small size and easily absorbed.

A CASE OF RECURRENT RETINAL HEMORRHAGE IN A BOY OF
18 YEARS THE RESULT OF (?) MALIGNANT ENDOCARDITIS.

BY

HAROLD B. GRIMSDALE, B.A., M.B., B.C., F.R.C.S.



Fig. 1

Left Eye.
x-1-05.



Fig. 2

Left Eye.
xiii-1-06.



Fig. 3

Right Eye.
xxi-4-06



Fig. 4

Right Eye.
xviii-10-06.

The most alarming symptom at this time was an indefinite grey halo, best seen with the indirect method, round the right optic disc. The left eye, on the other hand, showed continued improvement. Thus, a month later (13th January, 1906) it is noted, "all hæmorrhages in the left eye have been absorbed; there is still much radiating striation (rippling) of the retina beyond the macula; exudate as before, but the neighbouring area of the choroid shows atrophy of the superficial layers, and there are some patches which suggest local retinal degeneration. Right eye: more œdema round papilla; several hæmorrhages in the deeper layers, and some striation inwards."

In March 1906, he was again seen by Sir A. E. Wright, who reported that the coagulation of the blood was slower, and recommended the increasing of the calcium lactate to 60 grs. on alternate nights for one week.

Now, for the first time the right macular region showed striation, and a small hæmorrhage near the centre. R.V. was still 6 6 (with correction).

As the condition was not mending, a consultation was arranged with Dr. Cyril Ogle, who found that there was a cardiac murmur, and that the arterial tension was high; there was also on this occasion a trace of albumen in the urine, many previous analyses had shown no albumen, and it was found only on a few occasions. On Dr. Ogle's recommendation, small doses of potassium iodide were substituted for the calcium lactate. The diet was carefully regulated.

In spite of all, however, the right eye now became rapidly worse. A scotoma spread from the blind spot to the centre, and covered it; vision sank correspondingly. On April 21st it was noted, "R.V. 6 12 partly (with correction: a triangular patch of œdema extends" (*see* Fig. 3) "from the optic disc to the macula. The striation is perhaps less and the hæmorrhages fewer." (It should be noted that the number of isolated hæmorrhages was greater in the right eye, than it ever was in the left).

"An isolated patch of œdema has appeared below and internal to the disc, near the inferior nasal vein."

A month later, May 19th, R.V. 6 18. "There is still the triangle of œdema towards the macula; beyond it is an area of a dark-red colour, probably hæmorrhage in the very deep layer of the retina."

June 16th.—"R.V. 6 24. The patch of œdema is organising and has a tendency to bifurcate at the outer end. Below is a narrow hæmorrhage, which seems to separate the first from a second less markedly œdematous area, which is limited below sharply by a small vein." It was noticeable throughout the case that the areas of œdema were very easily stopped in their extension by the lines of vessels; it seemed as if the smallest pressure was sufficient to prevent the extension.

After this date things gradually became a little better; the congestion of the optic discs diminished and the whole ophthalmoscopic picture looked less threatening.

September 15th.—"Thinks he sees better; R.V. 6 24. L.V. 6 36. Below the white band in the right eye are still two small hæmorrhages and in the concavity is a white glistening dot. All œdema has gone." Later: "All the fundus looks quieter, but with the disappearance of the œdema superficial atrophy of the retina and chorio-capillaris has become visible over the macular region."

Vision gradually improved, and has been for some twelve months about 6 12. The letters are seen only momentarily, and as if through holes in a screen.

Remarks.—Such is the history of this unfortunate lad. Now, the question arises as to the cause of the affection.

The family and personal history do not help us much: it is true that F. M.—has obviously a defective circulation. The blue, cold hands, with their clubbed fingers, show a long-standing congestion of the parts, and the murmur which Dr. C. Ogle first discovered, and which still persists unchanged, is another sign of imperfection. The murmur, in Dr. Ogle's opinion, pointed to mitral stenosis. There was no history of past acute rheumatism to account for the lesion; the medical brother had examined F. M. — not long before, and had observed no defect. There is possibly some congenital weakness; several members of the family were said to have had "weak hearts."

The albumen which was found in the urine on two or three occasions was probably connected with the heart lesion, and did not indicate any disease of the kidneys.

It is curious, however, that no hæmorrhages were seen in any other part of the body. If the disease had been a general one, we should have expected to find petechial hæmorrhages in other regions, but on no occasion were they seen. It may be that they were of such small size that they were overlooked; certainly if they were all as small as those seen in the retina, they would not be visible through the epidermis but if there were a general hæmorrhagic tendency, some hæmorrhages would surely have been more extensive.

For this reason, the suggestion that the disease was the result of malnutrition in Spain, and was, in fact, a delayed scurvy, seems untenable.

On the other hand, there is the positive evidence that the coagulation period of the blood was prolonged, and this is strongly in favour of a general blood disease, of which the manifestations were too small to be perceived, except in the eye, where they could be seen magnified and with unusual distinctness. In other blood diseases, *e.g.*, pernicious anæmia and leukæmia, the hæmorrhages into the retina are among the most noticeable of the ocular symptoms, and few hæmorrhages are seen elsewhere. It is not likely that the condition of the retinal vessels predisposes this region to the chance of hæmorrhage; it follows, therefore, that hæmorrhages may occur elsewhere and remain unrecognized.

It was suggested that the disease might be syphilitic. This I think was most unlikely; the lad denied any possibility of the acquired form, and there was nothing in his appearance which would suggest that he was the subject either of the acquired or of the hereditary disease. Apart from this, the lesions found in the eyes, far from being characteristic, were very unlike those which are usually found in that disease.

Sequel.—It has seemed well to leave these notes as they were written in October, 1907. I saw him occasionally after, but about the middle of February, as I had not seen him for some two months, I wrote to his medical man, Dr. W. B. Winton, who said that in the middle of December F. M.— had suffered from a feverish attack, which was supposed to be influenza; in a few days' time he developed signs of broncho-pneumonia in the left base; temperature varying between 99.4°F. and 102°F. He slowly improved until the end of January, when the right base became affected in the same way. On one occasion there was a solitary lump of bright-red expectoration; and there were observed by Dr. Winton (to whom I am much indebted for these notes) two small petechial hæmorrhages over the 8th left costal cartilage. From this time he gradually lost ground, became thinner and weaker, and his temperature remained very irregular. Dr. C. Ogle, who again saw him, came to the conclusion that the disease was malignant endocarditis. The fatal result was delayed until May, 1908. The eyes remained unchanged during the latter part of the illness.

PERSISTENT ASTHENOPIA

BY

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THERE are a considerable number of patients who suffer from asthenopia, which may persist through many years, in spite of careful professional advice and treatment, in whom it is not easy to determine the essential ætiological factors. The following case-history will serve to illustrate, not only a very usual course pursued by one group of these cases, but will shed light upon their ætiology.

F. B. C., aged 10 years, the son of a very busy physician, was brought to me in June, 1897. He was a bright, active boy, in good health, but suffered from undue sensibility to light, and a blurring page after any protracted effort at near-work. He did not complain of headache, but the eyes flushed and became hot after reading or any work at the reading distance.

R.V. = 6 xii + 2.

L.V. = 6 vii + 2.

The fundus in both eyes was dark-red in colour, and fluffy; the nerves being small and quite as red as the surrounding ophthalmoscopic field. He had hypermetropic astigmatism. Sulphate of hyoseyamin was prescribed as a mydriatic with a view to its correction, and protective smoked glasses were required to be worn when exposed to light. After two days' instillation of the mydriatic, three times daily, the total static refractive error proved to be:

$$+ 2. D. \quad \begin{cases} + .50 \text{ axis } \begin{cases} 105^{\circ} \text{ O.D.} \\ 75^{\circ} \text{ O.S.} \end{cases} \end{cases}$$

With these glasses V. = 6 v each eye. There was no notable error in binocular balance. He received these correcting glasses, with a slight deduction from the spherical element, and was directed to wear them constantly.

Four months later, V. = 6 v each eye. The subjective and objective symptoms had disappeared. He was then permitted to return to school.

In August, 1900, the eyes were healthy and comfortable. He accepted no change in his glasses, and vision was normal in each eye.

Three years later—June, 1903, the patient, being now 16 years of age—he returned with smarting eyes, recurring attacks of headache, caused and aggravated by near work. He complained of a constant sense of strain and tension in the eyeballs. In the meantime the glass frames had been outgrown and his glasses practically abandoned. The fundus conditions, described as existing when he was 10 years old, had returned, and, in addition, there was inflammatory change in the choroid along the temporal border of each optic nerve. He rejected all glasses, and V. was 6 vi each eye. The anterior long, perforating ciliary vessels were full and dark, and the sclera bluish-white in its anterior segment. He once more received a mydriatic and smoked glasses, and after several days the refractive error was shown to be + .75 c, axis 90° for each eye. V. = 6 v, the 2 D. of hypermetropia having disappeared. There was no hyperphoria, but an esophoria of 2 + 2" at 6m., which disappeared after using the correcting glasses. Vision remained normal at 6m., but the eyes were weak, i.e., unduly sensitive to light, would not bear work, and remained a constant source of annoyance and trouble, retarding his school progress. The fundus oculi remained of a fluffy, flannel-red colour, the papillæ were congested, and the veins full and dark-red. He was finally, in spite of treatment, compelled to abandon his college course. He enjoyed comparative comfort if no attempt was made to use the eyes, but exposure to strong light, writing a letter, or looking over

the newspaper, was sufficient to flush the eyes and to bring on periorbital distress.

Elaborate studies of his secretions were made with negative results. His diet and habits were carefully scrutinized and regulated. Many drugs were administered without notable result. He was compelled to live in idleness, so far as the use of his eyes was concerned, from 1903 to 1906. Then a slowly, but steadily-increasing ability for work was noted, with occasional lapses into trouble if great care was not exercised. In 1907 he returned to his college work, but made many visits to the consulting-rooms with congested caruncles, conjunctivæ, and uveal tract, but managed to get on with his work until he once more broke down under the stress of his midwinter examinations, and was compelled to undergo once more the enforced rest and relief afforded by a mydriatic.

During 1908 he has for the most part worked with but little trouble, but returned in September last with frontal headache, after going through a series of entrance examinations. The macular region of both eyes was maroon-red and faintly granular, but in other respects the fundus was fairly healthy.

Remarks.—It is interesting to enquire into the cause of this asthenopia, extending from his 16th to his 21st year of age. The most careful and elaborate study failed to discover any general disorder to account for the local impairment of functioning power.

The *crux* of the matter seems to rest in the distention of the sclera in the anterior segment of the globe, as indicated by the increasing refraction of the eye. In the interval during which he had abandoned the use of his glasses, between his 14th and 16th years, he had lost 2 D. of hypermetropia. The sclera in the ciliary region had become thin and bluish-white, while the long, anterior ciliary arteries and their accompanying veins, which perforate the globe at this point, were large and full, suggesting ciliary hyperæmia and a relative increase of intraocular tension.

In addition to these indications of disease in the ciliary segment of the globe, attention is called to the crescent of choroiditis embracing the temporal margin of the optic nerves. Without treatment and rest from work, both eyes would doubtless have passed through the "turnstile of astigmatism" into myopic refraction, with the choroidal atrophies at the posterior pole, or, possibly, the posterior staphyloma, which characterizes the myopic ball.*

In point of fact, in this patient the distention of the ball, which neutralized two diopters of hypermetropia, was effected by a stretching of the sclera in the anterior segment of the globe.

The eyes remained healthy as long as the correcting glasses were worn, but their neglect, during the critical years of his adolescence, was doubtless an important factor in causing the return of the irritation and turgescence of the uvea. The tension of the ball was raised, its nutrition impaired, and the sclera stretched, thus increasing the diameters of the globe. Any effort at near-work was therefore painful and led to further injury.

* *Unt. article*, "School Hygiene," Vol. II, *System Diseases of the Eye*, by Norris and Oliver.

CLINICAL MEMORANDUM.

CASE OF RECURRENT DERMATITIS OF THE EYELIDS
RELIEVED BY SUITABLE SPECTACLES.

BY

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W.E., a steel turner, aged 40, came to the Hospital on February 2nd, 1908, complaining of a recurrent inflammation of the eyes. He gave a very unusual and interesting history, which was shortly as follows: three weeks ago his eyelids began to itch, then they got red and much swollen, they felt burning. This condition lasted for two days, after which the skin began to peel. They were then two days without any inflammation, when the whole cycle commenced again. The eyes got hot, then red and swollen, and then desquamation set in. There was a rest of two days, during which the lids remained normal, when a third time the whole process was repeated. At this stage the patient consulted me.



Present Condition.—A healthy man, with no history of any skin disease, and no diathesis to account for the condition. He has never had any variety of urticaria, nor any venereal disease. He is only a very moderate drinker. Both lids on each side are desquamating, and covered with large, flat, silvery scales, like those of psoriasis. The skin is hard, and has lost its elasticity; it is cracked and bleeding in places. The inset photograph gives a good idea of the patient's appearance at this stage of the disease. *February 3rd*, next day, the scales have all disappeared. *February 5th*.—Lids smooth, only a slight redness remains, practically normal. No treatment so far. On the 6th and 7th the eyes were quite normal. *February 8th*, both lids are dry and hot, and the lids feel harsh to the touch. *February 9th*, lids are now red and swollen. Two days later the patient was

seen again, and the lids were once more covered with scales. Arsenic internally and ung. picis externally were prescribed. This treatment had no effect, one cycle succeeding another. In all, three more attacks were observed. Patient was wearing R. + 4. L. + 4.5.

$$RV = 5.10 \text{ c.} + (-3.0) = 5.5.$$
$$1. N = 5 \text{ 10 c.} + \{ 2.5 = 5.5.$$

Indication: R_x = 3; L_r = 2.5; and given an ointment of oleate of zinc instead of zinc picis.

Remarks.—As soon as the patient got his correct glasses, the recurrent inflammation came to an end, and for a long time I have not seen the patient. The condition seemed to be a recurrent superficial dermatitis. I could ascertain no cause for it whatever; there was nothing in the man's work to account for it—he worked all day at an automatic lathe. I can find no record of a similar case, and so do not hesitate to put it on record.

I do not for a moment suggest that the reduction of an excessive correction of hyperopia cured the case, but simply record the fact that as soon as correct spectacles were worn, the dermatitis ceased. It is to be noted, however, that the local application was changed at the same time.

TRANSLATIONS.

ON THE VARIOUS INDICATIONS FOR THE LOCAL APPLICATION OF DRUGS BY THE SUBCONJUNCTIVAL ROUTE.

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Dr. A. DARRIK,

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Local therapeutics is indicated whenever it is necessary to act promptly and energetically. There is no better example than that of sympathetic ophthalmitis, the only treatment of which, until recently, consisted in enucleation and mercurialization.

No matter what theory of its pathogenesis be accepted, if general mercurial treatment be efficacious, its local application will be all the more so: the fact is already recognized and proved by numerous observations (Gallenga, Secondi, Richmond, Abadie, Rogman, Coppez, Sourdille, Darier, &c.).

Subconjunctival injections, had they done nothing more than establish *in certain circumstances* the curability of sympathetic ophthalmitis, would by that alone have proved their immense value.

In secondary, delayed, traumatic, or post-operative infection, subconjunctival injections have yielded results which could never have been obtained with such rapidity by the older methods of treatment. These facts constitute a kind of pure and very conclusive experiment, and prove the powerful efficacy of antisepsis injected under the conjunctiva in infections which are localized, and uncomplicated by concomitant phenomena which might obscure the observation.

The simplest infection of the eye ball is that produced by an infected corneal erosion. The commonest form is infective ulcer of the cornea. In this case, subconjunctival injections of cyanide of mercury produce the most certain and

efficacious antiseptics. Under serum therapy, the galvano-cautery, and subconjunctival injections, every infective ulcer of the cornea, if taken in time, can be promptly cured : such was not the case by the older methods.

Subconjunctival injections have, so to speak, a selective action on the choroid. In cases of choroiditis or chorio-retinitis, of central type and not too advanced, it is possible to study, almost mathematically, the truly remarkable action of subconjunctival injections. Indeed, the metric test-types permit one to control exactly the progressive improvement of the visual acuity, and, on the other hand, the ophthalmoscope shows with exactness how the anatomical lesion progresses or regresses. Senn Wyl published in *Archiv für Augenheilkunde* a long study on the action of subconjunctival injections in myopic choroiditis. Not only did he recognise in this local therapy what may be called a specific action, but after comparing sodium chloride and cyanide of mercury, he concluded that the latter was distinctly the better, and recommended, as we recommend, the 1 to 5000 solution as at once the most active and the least painful. It ought to be the same with diseases of the optic nerve, especially in certain cases of retrobulbar neuritis ; but in this case anatomical considerations prevent us from hoping for the *restitutio ad integrum* when too large a number of nerve-fibres has become atrophic. So that one can only look for a decided therapeutic result in cases where the optic fibres have only been compressed or palsied for the time being ; in a word, a cure is to be hoped for only when the inflammatory process, infective or toxic, is of recent date or has ended without involving the nerve in complete atrophy.

Finally, as regards subconjunctival injections, we must refer to diseases of the iris and ciliary body. In traumatic exogenous infections, characterized by iritis, iridocyclitis, and even iridochoroiditis, the effects obtained by local therapy are superior to all that general treatment has been able to offer in these affections (serum therapy excluded). The same remark applies to all affections of endogenous origin : syphilis, tuberculosis, rheumatism, blennorrhagia, etc., when general treatment has lost its effect. In a good number of these affections subconjunctival injections, which, of course, do not form a complete treatment in themselves, are often a very valuable help to general therapy.

Several cases of gummatous iritis treated opportunely by this means have been cured with great rapidity. The same may be said of some cases of old-standing iridochoroiditis which had been rebellious to general treatment for a long time ; but for acute and violent syphilitic iritis general treatment is the first indication. This is also the case in all violently acute inflammatory processes involving the iris and ciliary circle, whether of syphilitic, rheumatic, or other origin. Long clinical study of the facts leads one to conclude that *subconjunctival injections are contra-indicated, for the time being at least, whenever circulatory stasis makes absorption of the medicament by the lymphatic channels difficult or impossible*. The medicament injected under the conjunctiva would then act as an irritant, more hurtful than helpful, and cause violent pain and intense chemosis. When this important contra-indication has once been realized, by carefully following the clinical indications and choosing the opportune moment and the drug which is most clearly indicated, it is possible, not only to avoid these troublesome complications but also to obtain very favourable results.

Subconjunctival injections should not be repeated often : Nature must be allowed time to work. So long as swelling and chemosis persist, unless the indications be very *urgent*, it will not be necessary to give fresh injections. Injections of 2 per cent. sodium chloride, however, are so quickly absorbed that they can be repeated every day, or every other day.

Formulae and special indications for subconjunctival injections.

The first indications were given by Rothmund, who recommended subconjunctival injections of sodium chloride for the clearing of corneal leucomata. These remain good only for those cases where the *corneal infiltrates are recent*; better results can be obtained in old leucomata and calcareous infiltrations of the cornea by alternate application of dionine and injections of 1 c.c. of the following solution :

Benzoate of lithia	...	...	...	0.20 gramme
Sterilized water	...	...	...	10.00 grammes

once or twice per week.

In acute corneal infiltrations, in very severe infective keratitis, in certain cases of parenchymatous keratitis, at the commencement, and during the decline, a rapid clearing of the cornea may be obtained by injecting every day, every second day, then twice and once a week, according to the intensity of the reaction, 1 c.c. of this solution :

Sodium chloride	...	...	...	0.20 gramme.
Sterilized water	...	...	...	10.00 grammes

But if the infection is more severe, if it is a case of infective ulcer with hypopyon, it is well, after an injection of sodium chloride in order to feel one's way, to proceed to the injection of 1 c.c. every two or three days, of:—

Cyanide of mercury	...	...	...	0.01 gramme.
Sodium chloride	...	...	...	1.00 grammes
Sterilized water	...	...	...	50.00 ..

This 1 to 5,000 solution is usually well borne, especially if a few drops of acoin solution are added. Some authors prefer to inject only one or two drops of a 1 to 1,000 solution; the result is almost the same, but it is better not to employ concentrated solutions except on special indications, as in sympathetic ophthalmitis, where one may even inject, after enucleation, 1 c.c. of a *one per cent.* solution of cyanide into the bottom of the orbit.

This 1 to 5,000 formula is the one which is employed in cases of macular choroido-retinitis, myopic and otherwise.

The following solution,

Salicylate of soda	...	...	...	0.10 to 0.20 gramme.
Sterilized water	...	...	...	10 grammes

will do good service in episcleritis and rheumatic iritis, when, after several intravenous injections of salicylate, the inflammatory phenomena have quieted down and a prompt cure is required.

Iodide of potassium has been much vaunted lately in the treatment of lenticular opacities. Badal has recommended it in instillations and eye douches; Verdereau* and Pflugk** obtained much more rapid and marked results by injecting twice a week, i.e., of the following solution:—

Iodide of potassium	...	...	...	0.10 to 0.20 gramme
Sterilized water	...	...	...	10 grammes

This same solution is useful in gummatous infiltration of the sclerotic, if one is careful to alternate it with mercurial injections at an interval of several days, so as to avoid the formation of the biniodide.

A preparation of iodine, which has valuable uses, is the iodate of sodium, in 1 to 1,000 solution :

Iodate of sodium	...	...	...	0.10 gramme
Sterilized water	...	...	...	100.00 grammes

* See THE OPHTHALMOSCOPE, 1908, p. 612.

** For translation see THE OPHTHALMOSCOPE, 1908, p. 503.

It is perfectly painless, and has one quality not possessed by iodide of sodium or iodide of potassium. It is a remarkable reducer of tension in glaucoma symptomatic of irido-cyclitis of any kind, in glaucoma from seclusio pupillæ following tuberculous kerato-iritis, syphilitic iridocyclitis, in glaucoma from too rapid swelling of a needled lens, or from traumatic cataract, and, lastly, in certain absolute glaucomas which have been iridectomised without success. In all these cases after one to three subconjunctival injections of 1 c.c. of iodate of sodium 1 to 1,000, the tension diminishes in three days from $T. + 3$ to $T. + 1$ or $T. n.$

Those who see in subconjunctival injections merely a means of stimulation or of counter-irritation, have vaunted the same therapeutic means for the most varied affections. Thus, Peschel praises 15 per cent alcoholized water.

Injections of sterilized air would give identical results, but they should be specially reserved for affections of the cornea and iris which are considered to be tuberculous. Where injections of sterilized air are specially indicated is in serofulous affections of the eye (which one need not conclude are tuberculous), in severe phlyctenular kerato-conjunctivitis, in keratitis *en bandelette*, in serofulous pannus, especially when these are accompanied by photophobia. In these cases, and also in traumatic keratalgia, an injection of air twice a week brings about a prompt disappearance of the photophobia and a decided amelioration. This treatment is demanded by patients. In granular pannus injections of air would be useless. Parenchymatous keratitis of hereditary syphilis benefits little by injection of air, but when due to tuberculosis is very markedly improved. Episcleritis and sclerotising keratitis of tuberculous origin are also benefited.

But the real specific in tuberculous affections of the eye is guaiacol. This is so true that one can be almost certain that an *episcleritic* nodule or an *iritic lesion* which has been treated in vain with mercury, salicylate, etc., is really tuberculous if it improves or becomes cured after two or three subconjunctival injections of the following solution:—

Cacodylate of guaiacol 0.26 gramme.

Sterilized water 10.00 grammes.

This reaction is possibly even more positive than the cuti- or ophthalmoreactions. This specific action of guaiacol on tuberculous lesions of the cornea, sclera, and conjunctiva is all the more useful in that the subconjunctival injections are hardly painful, and not painful at all if two or three drops of alypin be added.

All the sera, anti-toxic, anti-tetanic, anti-diphtheritic, etc., can be profitably used as subconjunctival injections. This method of administration becomes all the more interesting, because *in many cases the serum can be administered by the mouth*; but since its action is then slower, one will get a very good result by giving a subconjunctival injection, which will have the advantage possessed by all local interventions, while at the same time it will bring about hyperæmia of the ciliary body with a more abundant afflux of antibodies into the aqueous (Wesseley).

ERNEST THOMSON

ON SUTURE OF THE EYE WITH REINDEER TENDON.*

BY

A. TERSON,

PARIS, FRANCE.

LIGATURES and sutures for use in the tissues of the eye and the structures surrounding it are naturally made of materials corresponding to the varying object for which they are required. They are of two classes: removeable and irremovable, the latter being chosen, as far as possible, from absorbable substances.

Non-absorbable ligatures and sutures, whether they are removed or end by being expelled, are either rigid threads (silver or Florence hair) which, although they are tolerated in some cases, are dangerous to the eye and even in the eyelids and neighbouring regions are not very often useful, or flexible threads (silk, cotton, or linen) which have replaced the old "well waxed" thread.

Fixed silks either flat and solid, or round, but always black, can be sterilised in various ways (in the autoclave, by alcohol vapour in tubes, etc.) and are valuable, but boiling renders them liable to break. True linen thread (not cotton), on the contrary, can be easily sterilised by boiling, which renders it more resistant. Accordingly, although we use very fine silk for sutures exposed to slight traction only, we have become accustomed to prefer linen whenever there is a risk that the thread may break while the knot is being tightened, as, for example, in certain ligatures in capsulo-muscular folding.

In any case silk and linen sutures, although they sometimes work out by degrees, almost always require to be removed by cutting with scissors after some days. In addition, they have the slight disadvantage of markedly increasing the conjunctival secretions. To sum up, they are not always satisfactory, although there are definite conditions in which their use is indicated.

For certain tissues, in cases where one does not wish to touch the suture, and ought not to have to do so, absorbable threads are obviously to be recommended.

Catgut, when too coarse, is bad, and when too fine, becomes absorbed much too soon, often leaving cicatrisation unfinished. It sometimes slackens, gets loose, or breaks, for its great defect, even when chromicised, is its want of firmness (*soli rito*). Finally, it causes a purulent deposit on the wounds, which is far from pleasing, and has the appearance of a scar. For a long time we have given up using it.

After numerous experiments with a view to finding a material at once absorbable and firm (*solide*), reindeer tendon has given us satisfaction, but it can only be used in ophthalmic surgery if it is very fine. No. 0 is much too coarse. We have had some good results with No. 00 (1) including (2) a case of a large corneal and scleral wound where removal of almost the whole of the iris and suture were followed by cure, with transparency of the lens and almost normal sight in a myopic eye.

M. Carrion, of Paris, has supplied us with threads of reindeer tendon, No. 000, in sterile tubes. This is the size which will be most useful in ophthalmic surgery. It is very suitable in a needle with a round eye for suture and conjunctival autoplasty in large wounds, for operations on the conjunctiva and inner side of the lids, for strabismus operations. Although we, as a rule, prefer linen thread or flat silk for capsulo-muscular folding, so as to be able

to remove it when we wish) and for enucleation, staphylectomy, etc. In the course of a few days after the operation the tendon, which is flexible and yet very firm, turns a chalky-white colour which stands out against the red tissues, where one can follow it, for about a fortnight as a whitish trail, like the milky way. The firmness of the thread and the slowness with which it is absorbed assure the lasting fixation of the parts brought into apposition. There is no need to remove the thread, and, in consequence, no risk of breaking down the cicatrix, or of frightening a timid child or pusillanimous patient.

In dealing with this material I shall not dilate on its use in the very numerous varieties of sutures for wounds of the eye which I have dealt with at length in my report on the subject.¹ I shall only repeat that apart from certain cases in which tarsorrhaphy alone or combined with suture is indicated, one will usually have recourse to episclero-conjunctival suture in one or more planes in preference to total scleral suture (intra- or extra-scleral). In some cases conjunctival autoplasty by large flaps or bands with liberating incisions, etc., is advisable, while in others a partial corneal covering (*encellulement*) is useful to favour the coaptation of the cornea when the absorbable tendon will be found of value as the pressure which it exerts on the cornea is softer and less dangerous than that of silk. Total conjunctival covering (*encellulement*) is usually to be avoided. In suturing the conjunctiva it is essential that the various layers of tissue should meet each other without strain and that the conjunctiva should be freed, and, if necessary, brought together with a looped padding ligature so that its surfaces meet each other and make a protecting cushion (*plastron*) which is not formed by episclero-conjunctival suture *en masse*. Suture of the cornea is hardly ever indispensable.

R. J. COULTER.

- (1) **Terson, A.** Traitement des plaies de l'œil. *Rapport à la Société Française d'Ophthalmologie*, 1908, Steinheil éd.
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REVIEW.

THE SURGICAL TREATMENT OF OPTIC NEURITIS.

BY

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UNDER medical treatment it is estimated that more than fifty per cent. of the cases of optic neuritis and "choked disc" end in complete loss of vision or terminate with a permanent central scotoma. In view of such unsatisfactory results, it is not surprising to find surgical treatment more frequently resorted to now than was the case but a few years ago. The advances made in the *technique* of cerebral operations, notably by Sir Victor Horsley, Cushing, Kocher, and Schloffer, have contributed very largely to this result.

The aim, of course, of every kind of treatment must be to remove the cause of the disease. In the case of optic neuritis, and more particularly "choked disc," the difficulties of obtaining this result are increased by the circumstance that the removal of the immediate or exciting cause, the

increased intracranial tension, is not sufficient in the great majority of cases to ensure a permanent cure, but must be followed, sooner or later, by removal of the predisposing cause, if that is possible. In ninety per cent. of the cases "choked disc" is caused by a tumour of the brain, and in the early days of localisation and brain surgery great hopes were placed on surgical procedures for dealing with these cerebral tumours. Unfortunately, these hopes have not been realized to the extent that one could wish, as most tumours of the brain cannot be removed. *Post-mortem* examination has shown that at most ten per cent. of these growths are removable. The best results have been obtained in cases of syphilitic gummata and cysts. In cases of sarcomata with distinct capsules, the prognosis is comparatively favourable, but even here recurrence is very common. Sir Victor Horsley records 23 recurrences within two years in 20 cases. Gliomata practically always recur, since they are not surrounded with a capsule, and it is most difficult to decide what is tumour and what is brain substance.

In most cases, then, the surgical treatment of optic neuritis arising from cerebral tumours will be limited to the relief of tension and the temporary preservation of sight.

Cerebral tumours, however, are not the only cause of optic neuritis. Cerebral abscess, cerebral aneurysm, simple serous cysts, hydatid cysts, serous meningitis, tuberculous meningitis, cerebral hæmorrhage, fractures and diseases of the orbit, affections of the periorbital sinuses, suppuration of the middle ear, thrombosis of the cavernous sinuses, hydrocephalus, acromegaly, pregnancy, etc., may all lead to optic neuritis, which may be successfully dealt with by surgical means. It is not the intention of the writer to deal with all of these conditions separately and in detail, some of which have been fully discussed in recent numbers of THE OPHTHALMOSCOPE, but rather to review some of the more important surgical procedures and the results obtained in some of the diseases mentioned.

Tapping the Sheath of the Optic Nerve.

Tapping the optic sheath was first suggested by de Wecker some thirty years ago. R. Brudenell Carter (*A Practical Treatise on Diseases of the Eye*, 1875, p. 427) describes the operation as follows:—"In cases in which swollen disc is associated with head symptoms of a grave character, such as intense headache, delirium, or stupor, M. de Wecker has suggested the advisability of tapping the sac of the arachnoid by means of an incision through the outer sheath of the optic nerve, and he has related an instance in which he put this plan into execution without any ill consequence, the state of the patient being such that improvement was hardly to be expected. He made an incision through the conjunctiva between the external and inferior recti muscles, and carried an index finger along the globe, which he luxated somewhat upwards and inwards, until he touched the distended nerve-sheath. The finger then served as a guide for a small guarded bistoury, by which a longitudinal incision was made through the sheath, quite up to its termination in the sclerotic. The operation would not be difficult of performance, and I can imagine conditions in which it might not only be justifiable, but possibly even curative."

This operation, however, was soon abandoned; beneficial although it might be, the effect was only temporary, the wound soon healed, and the conditions prior to the operation became re-established. The fluid which can be evacuated in this way is very small in amount, necessitating frequent repetition of the operation, a procedure obviously impracticable in view of the dangers to the

vessels and the nerves of the eye. Apart from this, it would be a case of looking for unnecessary difficulties to perform such an operation, when there are easier and more effective operations, such as lumbar puncture and trephining.

Lumbar Puncture.

Operation.—The patient should be lying on his left side with his knees well drawn up to the chin, or he may sit upon the edge of the bed with his legs hanging over the side and the body well bent forward. The landmarks are more easily found in the latter position, and the operation is more easily performed than when the patient is recumbent; and, if care is taken not to draw off more than 10-20 c.c., it is quite as safe as the former. Stringent antiseptic precautions are necessary, and local anaesthesia is advisable. A hollow needle, provided with a steel pin or mandarin, is introduced at a point situated $1\frac{1}{2}$ cm. to the right of the middle line and $1\frac{1}{2}$ cm. below a line joining the two iliac crests. It is then directed inwards and upwards so as to pass between the fourth and fifth lumbar vertebrae into the subarachnoid space. The needle should be 8-10 cm. long for adults, 4-5 cm. for children, and 0.8 to 1.6 mm. thick. It should be provided with a short point (not too sharp, so as not to make an unduly large opening in the dura) and a moderate-sized aperture. The patient should be kept in bed for twenty-four hours after the operation.

Indications.—Lumbar puncture may be indicated simply for the purpose of obtaining valuable information regarding the nature of the disease, information which may determine the lines of any subsequent operation; or it may be performed in the hope of palliating the symptoms or curing the affection. Whether the operation be performed for the first purpose only, or for the second or third, the fluid obtained should always be thoroughly examined. Normally, the cerebro-spinal fluid is a colourless and clear liquid; the specific gravity is 1003-1004, and the freezing point 0.60 to 0.65. It contains a trace of serum globulin (less than 1%) but no serum albumen. Pathological cerebro-spinal fluid looks hazy, and, on heating, a cloud of albumen is formed; it may be sanguineous, or tinged with green (bile), or it may be purulent. A cytological examination will show an increase of the polynuclear leucocytes in acute affections, whilst an excess of mononuclear lymphocytes will be found in tuberculosis, general paralysis of the insane, syphilis, etc. Bacteriological examinations may yield further information regarding the nature of the disease—the tubercle bacillus is found in 50 per cent. of the cases (de Ridder).

The pressure of the spinal fluid is generally raised in acute meningitis, serous meningitis, tuberculous meningitis, cerebral tumours, and in hydrocephalus. Occasionally, the communication between the intracranial fluid and the spinal fluid may be blocked, and a false inference drawn from the low pressure found on lumbar puncture.

Results.—Lumbar puncture has been found efficacious as a palliative measure chiefly in tuberculous meningitis, and as a curative agent in serous meningitis. Successful results have been obtained by a large number of authors, as by Quincke, Goldschneider, Leyden, Kroenig, Fichtne, etc. Among the more recent contributors, Frenkel reports a case of serous meningitis with double choked disc, diplopia, ptosis, and blepharospasm, intense headaches, vomiting, delirium, and epileptiform convulsions. There was no evidence of syphilis. Lumbar puncture was performed twice. The headaches and convulsions disappeared after the first puncture, and the patient regained

consciousness. The headaches reappeared slightly in a few days, but disappeared entirely after a second puncture. The patient was placed under the influence of mercury, and made a complete recovery. Babinski and Chaillous report a case of a young woman with double optic neuritis and paralysis of the right external rectus and intense occipital headaches. There was no evidence of tubercle or syphilis. Lumbar puncture was performed three times, and simultaneous injections of mercury were also given. The patient made a complete recovery. The same authors describe four other cases of a similar character, in which improvement followed lumbar puncture. Dor performed the operation on a girl of 14, who had "choked disc" in both eyes, lasting two months. She recovered completely after one puncture and was still well three years afterwards. Netter (cited by Frenkel) obtained a cure in seven out of eleven cases of non-tuberculous meningitis, and Courtellement and Galezowski were successful with a single puncture in a case of cerebro-spinal meningitis.

In cases of suspected cerebral tumour it is necessary to proceed with the utmost care. It is a good rule to remove so much the less cerebro-spinal fluid the greater the severity of the symptoms, and to repeat the operation rather than to run the risk of removing at one time any considerable quantity. If these precautions are taken, no danger need be apprehended, and lumbar puncture may be performed repeatedly without any accident; otherwise, the risks are very real. Cases of sudden fatal issue have been reported more than once.

Where the diagnosis of cerebral tumour is certain, it is better to proceed at once to craniectomy, for the relief obtained by lumbar puncture is only temporary; craniectomy must follow sooner or later, and the sooner the better.

In cerebral tumours, abscesses, and cysts, the examination of the cerebro-spinal fluid is negative, unless complicated by some inflammatory affection of the meninges, in which case a mistake may be made in the diagnosis.

The question as to whether lumbar puncture should be preferred to the major operation of trephanning without opening the dura, is one upon which authorities do not agree. Those who prefer lumbar puncture urge in its favour that it is rapid in action and very effective, that it is harmless, that it can be easily repeated, and that it is a valuable aid in diagnosis, while, on the other hand, they maintain that simple opening of the skull acts slowly, that it is a long and delicate operation, and sometimes fraught with grave consequences. Those in favour of simple craniectomy are of opinion that this operation should be preferred, because its effects are more lasting, and because it is harmless and never fatal, whilst lumbar puncture is only transitory in effect, and its repetition depresses the patient, besides being not without danger. Numerous cases are reported in favour of both arguments. Babinski and Chaillous describe a case of double optic neuritis, where good vision was maintained nine months, during which lumbar puncture was performed seven or eight times. Then vision became worse; craniectomy was performed, and a tumour weighing 310 grms. was removed, but the patient died on the table. Most of the improvements recorded in similar cases after lumbar puncture date from the eighties and nineties; remarkably few have been reported during the last half-dozen years, so that it would seem as if, in cases of tumour of the brain, lumbar puncture had been given up in favour of trephining.

A case of cerebral hemorrhage was cured by lumbar puncture by Babinski. The patient had fallen from a height, and had remained unconscious for several days, during which there had been frequent attacks of hæmatemesis, but no hæmorrhage from the nose or ears. On regaining consciousness, vision was found to be reduced in both eyes. There was a edema of both optic discs, which persisted for five weeks, along with violent

headaches. At the end of this time lumbar puncture was performed. The headaches disappeared and vision became normal in the course of a month.

In cases of optic neuritis of syphilitic origin, lumbar puncture is sometimes of service in removing the headaches due to syphilitic changes in the meninges; when osseous changes have occurred, it is practically useless.

There are at present no cases on record in which lumbar puncture has been tried in cases of optic neuritis arising from pregnancy. Since optic neuritis in these cases is probably due to excessive hyperplasia of the hypophysis followed by increased intracranial tension, it would seem worth while to give lumbar puncture a trial before resorting to the extreme measure of inducing abortion or premature labour.

Trephining.

Operation.—It would carry us too far to enter into the *technique* of the operation of trephining. Suffice it to say, that most authorities now recommend that the operation should be performed in two stages, at the first of which only the opening into the skull should be made, and any further procedure left for a subsequent occasion.

Relationship of Optic Neuritis to the Site of Cerebral Disease.—It is all-important for the success of the operation that the diagnosis should be correct. Horsley found that: of 79 cases in which the diagnosis was correct, and the tumour removed, 7 died of shock 8.9%; of 16 cases incorrectly diagnosed and not removed, 6 died from shock 37.5%.

In cases where it is impossible to remove the tumour, where, therefore, only a palliative operation—Cushing's "decompression" operation—remains to abolish the optic neuritis and relieve the headaches, it is of the utmost importance that the pressure be relieved directly over the seat of the lesion. Horsley records 13 cases which died of shock after the second stage of the operation, and in which the pressure had not been relieved exactly over the seat of the disease, in 7 by reason of failure of topographical diagnosis. In 6 others, in which a tumour was diagnosed and correctly localized, but in which removal was not attempted owing to the size of the growth and other reasons, no patient died.

A controversy has arisen recently concerning the value of optic neuritis as a factor in determining the site of the operation. Sir Victor Horsley, among others, has been foremost in teaching that optic neuritis appears first on the side of the lesion, that in cases of unilateral "choked disc" the cerebral affection is situated, in most instances, on the side of the affected nerve, that in bilateral "choked disc" the cerebral lesion is on the side on which the changes in the optic nerve are most advanced. However, in a paper recently read before the Ophthalmological Society, Leslie Paton brought forward statistics tending to show that little reliance can be placed on the sign. "In 72 cases observed at the National Hospital, Queen Square, London, the height of the swelling did not differ by more than 0.5 D., a difference which is within the limits of observational error. In 39 cases there was a difference of 1 D. or more between the two eyes; in 23 of these the swelling was greatest in the eye on the side of the tumour, in 16 it was greatest on the opposite side." The preponderance in the figures in favour of the homolateral eye was mainly due to temporo-sphenoidal and parietal tumours. Taking these away, the preponderance was rather the other way. With regard to the onset of the neuritis in one or other eye, Paton found in 37 cases of cerebral tumour, the neuritis was homolateral in 23. Unfortunately the cases were not all verified by autopsy or operation. R. Marcus Gunn holds that the truth lies somewhere between the views expressed by Horsley and Paton. In his opinion, in tumours occupying the anterior half of the brain,

the new growth is generally on the same side as the earlier or more intense optic neuritis. But in the posterior half of the cerebrum, and in the cerebellum, the ophthalmoscopic findings are of little or no value in this respect.

Apart from clinical evidence, which does not seem very conclusive as yet, there does not appear to be much to support the view of homolaterality. General considerations would not lead one to expect a great preponderance of cases in favour of or against homolaterality. Choked disc is considered to be intimately associated with increased intracranial pressure—a view which derives considerable support from the observations of Dupuy—Dutemps, who has recently shown that in these cases the central vein is quite patent in the nerve, but appears collapsed in the intervaginal space. If the intracranial pressure is directly responsible for the compression and collapse of the central vein, there would appear to be no reason why the homolateral vein should collapse before the other, unless the local resistance of the vessel wall happened to be less than on the other side. The spaces containing the cerebro-spinal fluid communicate freely with each other. The pressure, therefore, on both sides should be the same.

Effect of the Operation upon the course of Optic Neuritis arising from Cerebral Tumours.—In a series of 105 cases which had occurred at the National Hospital for Paralysis, Paton found it possible to examine 30 cases more or less thoroughly regarding the condition of the eye after the operation. In 8 the vision was little, if at all impaired; in 11 the patients were blind, or almost so, before the operation, and recovered vision more or less completely after the operation. 8 cases were practically blind at the operation; 6 of these did not regain vision, and 2 became worse in spite of the operation. In the remaining 3 cases, one eye became blind, or nearly so, while the other retained good vision.

Palliative Trephining.—In cases where the tumour cannot be found, or cannot be removed, the operation serves the purposes of palliative treatment, and may be very useful in this respect.

In an analysis of 221 cases, v. Hippel found that vision was improved or retained in 61. This seems a small proportion, but in 92 of the cases vision was practically useless before the operation, and in the remaining cases, of which there were no complete records, we may be quite certain that they were only operated on when the disease was far advanced.

The prognosis, as regards vision, therefore, is good if the cases are taken early and operated on while vision is still good; it is unfavourable, however, if vision is poor or *nil* at the time of the operation. Even in cases of a specific character, early operation should be resorted to, in order that the inevitable injurious changes in the nerve should not be allowed to begin, for once established, the damage is irretrievable. In syphilis, according to Horsley and Kocher, the cerebral tissues often offer such resistance to the action of antisyphilitic remedies that it is not by any means always possible to prevent blindness without resorting to operative interference.

Sometimes an operation, merely undertaken for the relief of symptoms, effects a cure. Cases of a *dema cerebri*, pseudo-tumour, chronic hydrocephalus, serous meningitis, traumatism, etc., may be cured in this way.

An early operation prolongs the life of a patient. Out of the 61 cases mentioned above, 41 lived longer than six months; 31 of these lived longer than a year, 25 longer than two years, 6 lived 3 to 5 years, and 10 appeared cured. Of the 92 cases mentioned above, who had poor vision before the operation, 20 died, and in 56 vision did not improve; of these 56, only 11 lived longer than six months.

Cerebral Puncture.

What has been said about lumbar puncture applies in many ways to the operation of tapping the ventricles of the brain. It may afford valuable information with regard to the nature of the disease, and in some cases, *e.g.*, serous meningitis, it may be sufficient to cure the disease. The operation is comparatively simple, and, if necessary, may be repeated. Neisser reports a case in which he performed the operation nine times, finally succeeding in locating a suspected tumour. Of late, the advantages of the operation have been more particularly emphasized by Kocher, Neisser and Pollack, Middeldoff, Tillmanns, and others.

Operation.—The operation is performed under local anaesthesia. An incision is made down to the bone, the periosteum divided, and the bone perforated with a Doyen drill. The drill is oval-shaped for the outer table of bone, and ball-shaped for the inner table, so as to avoid any injury to the dura mater. The hemorrhage from the bone is stopped in the usual way. A fine needle attached to a syringe is then introduced through the opening and a small quantity of fluid drawn into the syringe.

As regards the site of the operation, various points have been recommended. In the newly-born it is usually not necessary to pierce the bone; a membranous spot may be chosen. In older children the cranium may be entered from in front, above, and to the inner side of the frontal eminence (*v.* Bergmann), or from the side, 3 cm. behind and 3 cm. above the external auditory meatus (Keen); or from above, 3 cm. in front of the precentral fissure, and 2 cm. from the median line (Tillmanns, Kocher, Neisser). Many attempts have been made to establish permanent drainage. Mickulicz allowed glass-wool to heal into the subdural space; Payr has transplanted living pieces of human arteries into the lateral ventricle; and Kuttner formed a tube out of a flap of the dura, and inserted it into the ventricles.

Results.—Cerebral puncture has generally been undertaken in cases of hydrocephalus. The latter condition usually looms so largely in the mind of the operator, that there is little or no mention of the condition of the eyes beyond a general statement that vision improved. Springer, however, reports a case in which he tapped both lateral ventricles and the condition of choked disc disappeared.

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*For abstract see p. 479 of the present number of *The Ophthalmoscope*.

CURRENT LITERATURE.

NOTE. Communications of which the titles only are given either contain nothing new or else do not lend themselves to abstract.

I.—THE SURGICAL TREATMENT OF OPTIC PAPILLITIS.

- (1) Spiller, William G., and Frazier, Charles H.—Cerebral decompression—palliative operations in the treatment of tumours of the brain. *Trans. College of Physicians of Philadelphia*, Vol. 28, p. 73.
- (2) Cushing, Harvey, and Bordley, James, junr.—Subtemporal decompression in a case of chronic nephritis with uremia, with especial consideration of the neuro-retinal lesion. *American Journal of the Medical Sciences*, October, 1908.
- (3) Hippel, Eugen von.—On palliative trephining in cases of "choked disc." Ueber die Palliativtrepanation bei Stauungspapille.) v. Graefe's *Archiv für Ophthalmologie*, Bd. LXIX Heft 2, November 3, 1908.
- (4) Robinson, George.—Decompression in choked disc. *Ophthalmology*, January, 1909.

(1) Spiller (Philadelphia) considers that palliative treatment has an important place in cerebral surgery. Relief from such distressing symptoms as choked disc, headache, vertigo, nausea, vomiting, and convulsions, is by no means to be despised, even although the cause, in the shape of a cerebral tumour, be not removed. Indeed, relief from many of these symptoms is often permanent during the period the patient may continue to live, and since the growth of the tumour is not hastened by the palliative operation, and may be slow, one is thankful for the means of relieving the distressing manifestations of intense intracranial pressure. Spiller is somewhat sceptical as regards the disappearance of Jacksonian convulsions after merely opening the skull and dura if the convulsions are very frequent. The apparent unanimity of opinion as regards the effect on "choked discs" of opening the skull makes the necessity of this operation at an early period very evident. It is a mistake to regard palliative operations as a substitute for radical operations. The experience of Horsley as regards atrophy of tumours as a result of palliative operations appears to be unique, since Spiller has never seen any such result in his cases. Spiller is almost convinced that it is better to leave a tumour untouched if a part only can be removed, especially if the growth is a glioma. He doubts whether a palliative operation, whereby the tumour is not partially removed, favours the growth of an intra-cranial tumour by relieving pressure. The author has had cases in which the symptoms of brain tumour disappeared entirely or almost entirely after an opening had been made in the skull and dura. In some of these cases an incorrect diagnosis had been made, and in others relief of pressure had permitted the tumour to grow so slowly that it caused but few symptoms. Spiller's conclusions are as follows:—(1) Palliative operations should be performed early in every case in which symptoms of brain tumour are pronounced and before optic neuritis has advanced far, especially when

syphilis is improbable or antisyphilitic treatment has been employed. (2) Partial removal of a tumour, especially of a glioma, is a questionable procedure. (3) Palliative operation does not, under ordinary circumstances, cause atrophy of a brain tumour, and probably does not arrest its growth; on the other hand, it probably does not hasten its growth. (4) Palliative operation is not to take the place of a radical operation when the latter can be performed without great risk to the patient. (5) In some cases the symptoms of brain tumour disappear almost entirely for a long time or permanently after a palliative operation. This result is obtained either by relief of intra-cranial pressure or by removal of some lesion (meningitis serosa, etc.) other than brain tumour, and yet causing the symptoms of tumour.

Frazier (Philadelphia) next takes up the indications for and the *technique* of cerebellar decompression. It has been estimated that but about 1 per cent. of cases are operable—*i.e.*, that the tumours can be localized, approached, and entirely removed. Be that as it may, the fact remains that there is no inconsiderable number of persons who, having brain tumours, present a group of symptoms causing the intense pain and discomfort which cannot be relieved by a single drug in the Pharmacopœia. Every one of these symptoms, which include headache, vomiting, and "choked disc," may be relieved by an operation which requires but a few moments for its performance and which is attended with no risk to life when done under proper conditions and by an experienced surgeon. The so-called palliative operation should be performed very soon after the diagnosis of brain tumour has been established, without waiting for the results of mixed treatment or for signs of accurate localisation. Under no circumstances should one delay for longer than a few days, at the most, after the development of a "choked disc."

With regard to *technique*, Frazier has operated more frequently in the case of cerebellar than of cerebral lesions. **Site of operation.**—In lesions of the cerebellum, operation should be in the suboccipital region—that is to say, the bone should be removed immediately over the cerebellar hemisphere. The relief that would doubtless be afforded by removal of bone from the vault of the cranium would be diminished by the presence of the tentorium cerebelli. Almost as a routine method, Frazier has in cerebellar lesions, in which the lesion was not found, made it a practice to take away a portion of the cerebellar hemisphere, partly to facilitate exposure of the cerebello-pontine angle and partly for the purpose of affording greater relief from excessive intracranial tension. This addition, in his experience, has neither added to the risks nor increased the mortality. It is not necessary to remove bone from both sides. The area of bone removed should extend almost to the median line, externally without opening the mastoid cells, not nearer than 2 c.c. to the foramen magnum, and 1 or 2 c.c. above the line of the transverse sinus. In lesions of the cerebrum, a choice must be made between the occipital, the parietal, and the temporal regions. The temporal region, on the whole, is to be preferred, owing to the presence of the temporal aponeurosis, which diminishes the likelihood of a *fungus cerebri* (Sanger).

Management of the dura. The treatment of the dura is a point in *technique* concerning which there is some diversity of opinion. It has been stated that the dura is an unyielding membrane, and that removal of the overlying bone alone is insufficient to provide the necessary relief of intra-cranial tension. Frazier's experience is not in accord with this view. Even when the dura is not touched, cases show that (a) relief may be adequate and permanent, (b) hernial protrusion may develop.

Decompression operations appear to be fully justified by results. A

striking example of relief to symptoms is mentioned in a man aged twenty-three years, who presented every symptom of a cerebellar lesion, but none that would definitely localize the growth to one side or the other. Headache was intense and almost constant; vomiting was more or less frequent; sight was much impaired by double "choked disc"; vertigo and ataxia were marked. Left cerebellar craniectomy was performed, and in the course of the exploration one third of the cerebellar hemisphere was taken away. Headache disappeared almost at once after the operation, vomiting ceased, and sight improved. When the patient left hospital about two months after operation, vision was almost completely restored. The patient at the present time, two years and three months after the operation, looks the picture of health. He is a railroad employee, weighs 184 pounds, and with the exception of occasional "dizzy spells," says he feels quite well.

SYDNEY STEPHENSON.

2. **Cushing and Bordley's** unusual and interesting case of chronic nephritis with an extreme degree of neuro-retinitis, is related at such great length that a satisfactory short abstract is difficult to write. It may therefore suffice to say that the authors were led to suggest decompressive craniectomy in this case on account not only of the advancing change in the eye-grounds, but of the patient's condition of semi-coma, associated with high intracranial pressure; and to quote their conclusion, "that in view of the marked improvement after cerebral decompression, this case adds further evidence in support of Traube's hypothesis (favoured by Bramwell, Russell, and others), that the cerebral symptoms present in the so-called state of uremia are largely due to pressure from oedema of the cerebral tissue." The account of the case bristles with facts, which, however, are primarily of interest to the physician rather than to the ophthalmologist.

ERNEST THOMSON.

3. **von Hippel's** communication is based on a literary survey of 221 cases where trephining was performed for various affections of the brain in which "choked disc" was present. The reports of many of these cases were extremely defective, and the tabulation of their results was consequently all the more difficult. v. Hippel has, therefore, often to resort to rather artificial grouping, which makes a rapid survey of his deductions a matter of considerable difficulty. The only case of his own which he reports was a large sarcoma of the cerebellum, with very defective vision, wherein death supervened thirteen days after operation. All the same, there is no doubt that early operation, if performed under proper conditions by an experienced surgeon, offers a chance of improving and retaining sight in cases which otherwise would certainly terminate in blindness, although life might drag on for a very considerable time.

If the operation be performed at a time when vision is still useful or just beginning to fail, the chances of success are best. They are but slight if vision be very defective, and practically *nil* where blindness has lasted some time. v. Hippel does not doubt that in most reported cases operation has been delayed too long. It must also not be forgotten that many cases which present the symptoms of tumour are not tumours at all, but instances of chronic hydrocephalus, pseudo-tumour, hypertrophy of the brain, or meningitis serosa. Timely operation under such circumstances may lead to complete recovery, while if the operation be unduly postponed, blindness might mar an otherwise favourable result. Even in cases of tumour, a comparatively large number of the patients survive for a considerable time and the retention of useful vision is very desirable, especially as the other symptoms—headache

and vomiting—are also relieved. At the same time, the immediate danger of the operation is not small, although actual figures are not yet available; but the danger is much smaller in the hands of a surgeon with special experience of the subject. The following points should always be kept in mind: chloroform anaesthesia (not ether); operation in two stages, whenever possible; cocainisation of the dura mater before incision; avoidance of sudden draining off of the cerebro-spinal fluid; perfect union of the soft parts after operation; no hammer or chisel to be used. Hernia cerebri is not uncommon after the operation, but seems to be a natural outlet of intracranial pressure, and of no great consequence. The author is not in favour of the osteoplastic method. As a rule, the dura mater must be incised, although sometimes this—the second stage of the operation, which, of course, greatly increases the risks—can be omitted, if after the first stage the swelling of the disc is reduced or the vision improves.

In the complete absence of any localising symptoms, the right parietal region should be selected for the trephining, but otherwise the field of operation should be chosen as near the probable seat of the affection as possible. Lumbar puncture is hardly admissible in case of tumour, especially of the posterior cranial fossa; in other processes lumbar puncture may prove satisfactory, especially if repeated. It is, of course, much less dangerous, and so might be tried first. The same remark applies to puncture of the ventricles.

A curious form of optic neuritis is sometimes seen in connection with affections of the ear. Its peculiarity consists in its increasing or even appearing after radical operation has removed the focus within the skull, and it may persist for weeks and months without pointing to any complication or endangering the sight. Its pathology is still obscure.

v. Hippel finally discusses the much-contested question of the aetiology of optic neuritis in tumour of the brain. He concludes that the favourable results of trephining, especially the remarkably short time which often suffices for visible improvement, point to increased intra-cranial pressure as the primary cause of the optic neuritis.

R. GRUBER.

(4) **Robinson** (Philadelphia) reports a case in which the operation of "decompression," performed by J. Thompson Schell, was followed by a good result, although the patient did not remain under observation for longer than about one month. Essential details follow:—

A man, aged 40 years, who denied syphilis, complained of failing sight, intense paroxysmal headache, diplopia, and vertigo. Duration of symptoms, about two months. *On examination.* R.V., 1 5. L.V., 2 5. Pupils 3mm. and active. Homonymous diplopia, due to paralysis of each external rectus and of the left superior oblique. Slight contraction of the visual fields. "Choked discs," the swelling (*plus* 7 to D. Sph.) being more pronounced in the right than the left eye. The neurological report brought out several additional facts as, for example, unsteady gait, with tendency to walk to the right, slight exophthalmos as regards the right eye, and nystagmoid movements when eyes were turned to the right, right knee-jerk diminished and left somewhat increased. *Operation.*—By means of a trephine the subdural space was opened on each side of the occipital region, and the openings thus made were connected by removal of the intervening bridge of bone. No tumour found, but the dura bulged on the right, although not on the left side. A considerable quantity of cerebro-spinal fluid escaped when the button of bone was taken away from the right side. *Result.* As the almost immediate result of the operation, patient lost his headaches, his diplopia became much better, and the swelling of the optic discs was reduced (*plus* 3 D. and 4 D. sph.). One month after operation, R. V. $\frac{1}{2}$, L. V. 2 3 ptly., discs seen with *plus* 1 D. to *plus* 2 D. sph.

In commenting upon the foregoing case, Robinson largely adopts the views of Sir Victor Horsley, as stated in *THE OPHTHALMOSCOPE* of September, 1908.

SYDNEY STEPHENSON.

II.—OPSONINS AND THE EYE.

zur Nedden. On the significance of opsonins as regards the eye.
(Ueber die Bedeutung der Opsonine für das Auge.) *Zeitschrift für Augenheilkunde*, April, 1908.

zur Nedden (Bonn) first alludes to the fact that Wright's work was received in Germany with much scepticism until recently, when German research had repeated, and to a certain extent confirmed, the practical value of his experiments.

As regards the eye, the cardinal point is: **Do opsonins pass from the blood of non-immunised animals into the conjunctival secretion and into the vascular tissues of the eye?**

Schneider (*Munch. med. Woch.*, 1908, No. 3.) has discovered that the second aqueous humour, secreted after paracentesis, can so influence typhoid bacilli that they are more easily ingested by phagocytes, whereas the primary aqueous has only a very feeble opsonic action.

The different results obtained by researches upon opsonic action are probably accounted for by the different methods employed. It is of great importance how the leucocytes are prepared. No toxins or disinfectants must be used, the pus must be fresh and white cells must not be aggregated into clumps, and, lastly, they must be centrifugalized for a very short time only.

Following the advice of Professor Kruse, the author obtained his phagocytes from the peritoneum of a guinea pig after an aseptic peritonitis had been induced by injecting aleuronat. He gives a clear account of the method he employed to determine the degree of opsonic action.

1.—Opsonins in the conjunctival secretion.—As regards gonorrhoeal conjunctivitis, zur Nedden finds that the secretion has a powerful opsonic action on diplobacilli and dysentery bacilli, and this is the more evident the greater the amount of secretion. If the secretion has thickened, or if it be heated to 50°, there is no opsonic action. No such power could be *experimentally* determined in Koch-Weeks' conjunctivitis, nor for the secretion of the inflammation caused by the diplobacillus or the pneumococcus; it may be that on account of the enormous number of Koch-Weeks' bacilli, the opsonins are left over to pass into the secretion. We know *clinically* that the Koch-Weeks' bacillus is ingested, and so there must be an opsonic change. zur Nedden proved that the leucocytes alone could not ingest bacilli; the presence of serum was necessary. The fluid part of gonorrhoeal secretion has a much stronger opsonic power than that of Koch-Weeks' secretion.

The experiments prove that the opsonic substances of normal blood pass over into a gonorrhoeal secretion. zur Nedden finds that normal tears and the normal secretion of the conjunctiva has no opsonic power, nor can such be detected in pus from the lacrymal sac.

2. The opsonins of the aqueous humour. The primary aqueous does not increase phagocytosis more than normal saline, but the secondary aqueous, drawn off a few minutes after the reforming of the anterior chamber, has a powerful opsonic action. The longer one waits before withdrawing it, the weaker its opsonising ability. After 3 to 6 hours no opsonins are present. Frequent paracentesis has no greater effect than a single operation. Puncture of the vitreous has a similar action, which is more permanent than that of paracentesis of the cornea. Inflammation of the eye increases the opsonic value of the aqueous. Injection of concentrated solution of common salt

under the conjunctiva has a much less energetic action than inflammation. The opsonic value of the aqueous is, under all circumstances, less than that of the blood serum.

3.—**The opsonins of the vitreous humour.**—The vitreous of a normal rabbit contains no opsonins. After repeated puncture, however, it exerts a stronger opsonic power than normal saline. The opsonins of the blood pass into the vitreous only slowly after paracentesis of the globe. Puncturing the anterior chamber does not influence the opsonins of the vitreous. Subconjunctival injection has no effect. Moderate inflammation increases the opsonins.

4.—**The opsonins of the lens and cornea.**—Neither the normal nor the inflamed *lens* of the rabbit contains opsonins, nor can they be produced by inflammation elsewhere. As regards the *cornea* it is impossible to arrange exact experiments. zur Nedden has elsewhere investigated the conditions in the cornea before and after a Saemisch section. Before the section, the cells contain no bacteria; after it, phagocytosis is often very evident; thus shewing that the effect of a Saemisch section is to allow opsonins to pass from the blood into the cornea.

zur Nedden's paper is a record of laborious and patient research, and is a very important addition to our knowledge of immunity in the eye.

T. HARRISON BUTLER.

III.—BACTERIOLOGY.

- (1) Todd, Frank C.—Infection with Morax-Axenfeld diplobacillus. *Ophthalmic Record*, January, 1908.
- (2) Foster, Matthias Lanckton.—Dacryocystitis due to typhobacilli. *Archives of Ophthalmology*, July, 1908.
- (3) Zade, Martin.—Contribution to the knowledge of corneal ulceration due to diplobacilli. *Klin. Monatsbl. f. Augenheilkunde*, August, 1908.
- (4) Fava, Attilio.—Researches on the microbiology and parasitology of the eyelashes. *Annales d'Oculistique*, août, 1908.
- (5) McKee, Hanford.—The cultivation of the meningococcus from eye conditions complicating epidemic cerebro-spinal meningitis. *Ophthalmic Record*, September, 1908.
- (6) Rosenhauch, Edmund.—On some infections of the visual organ with influenza bacilli. (Ueber einige Influenza Infectionen des Sehorgans.) *Klin. Monatsbl. f. Augenheilkunde*, October, 1908.
- (7) Fischer, Theodor.—Contribution to the action of Pfeiffer's influenza bacillus within the eye. Beitrag zur Wirkung des Pfeiffer'schen Influenzabazillus im Auge. *Klin. Monatsbl. f. Augenheilkunde*, Oktober, 1908.
- (8) Pusey, Brown.—Conjunctivitis associated with bacillus pyocyaneus in an adult; bacillus pyocyaneus found in a normal conjunctival sac. *Archives of Ophthalmology*, November, 1908.
- (9) zur Nedden.—Some rare bacteriological conditions in ulcus serpens. *Archiv f. Augenheilkunde*, Bd. LII, and *Archives of Ophthalmology*, January, 1909.
- (10) Todd, Minneapolis, Minn.—reports a series of cases of conjunctivitis and ulcerative keratitis associated with the Morax-Axenfeld diplobacillus.

The cases did well under the use of zinc sozoiodolate, grs. 2 to 10 to the ounce of water. Ichthyol ointment, 10 per cent., was also of service. The author insists upon the tendency to relapse shown by these particular infections.

SYDNEY STEPHENSON.

2 Three weeks after a lad had been discharged as cured from typhoid fever, he presented himself before **Foster** on account of an acute dacryocystitis. Cultures of typhobacilli were obtained in bouillon and blood-serum from pus evacuated from the inflamed lacrymal sac. The question suggests itself whether various purulent inflammations of the mucous membranes may not prove ascribable at times to an antecedent typhoid fever, and whether persons suffering from such conditions may not be active distributors of typhoid fever.

SYDNEY STEPHENSON.

3 **Zade** describes twenty-seven cases of corneal ulceration in which smears and cultures yielded diplobacilli. Of particular interest was the complete absence of conjunctivitis preceding or accompanying the affection of the cornea. This observation leads to the conclusion that the diplobacilli may lead a saprophytic existence in the conjunctival sac, unless preference be given to the view that foreign bodies are the carriers of the infective agent. Injury, indeed, was the immediate cause of the corneal ulceration in many instances. The well-known clinical picture with its varying degree of severity (*see THE OPHTHALMOSCOPE*, 1905, p. 630) repeated itself in Zade's cases. With regard to treatment, zinc sulphate again proved itself to be the best remedy. It was applied in the following way:—a $\frac{1}{4}$ per cent. solution was instilled every half-hour, compresses soaked in a 3:1000 solution were applied for several hours during the day, while at night an ointment was put into the eye containing zinc sulphate, $\frac{1}{4}$ per cent., and ichthyol, 1.5 per cent.

CHARLES MARKUS.

4 **Fava's** paper, which gives a preliminary account of a series of experiments carried out under the advice of Morax at the Lariboisière Hospital and the Institut Pasteur, should be read in the original by those who take an interest in the subject. It is written in such a wandering style that it is impossible to give a satisfactory abstract, but the following conclusions would seem to be justified by the results obtained:—(1) Micro-organisms, which usually produce no reaction when injected into the peritoneum or veins of animals, may be capable of setting up grave inflammation of the eye when injected into the vitreous of animals, are found in all parts of the eyelashes of both diseased and healthy eyes. 2 The eyelashes can be rendered sterile by the method of disinfection carried out at the Lariboisière, which consists in: (a) washing with soap after cocaineisation; (b) douching and scrubbing (*lavage et friction*) with a 5 per 1,000 solution of oxycyanide of mercury; (c) douching with sterilised water; (d) douching with 1 in 5,000 solution of oxycyanide of mercury.

R. J. COULTER.

5 A good deal of **McKee's** Montreal communication is occupied by a discussion of the differential diagnosis between three Gram-negative diplococci, *viz.*, the gonococcus, the micrococcus catarrhalis, and the meningococcus. He is of opinion that for diagnostic purposes the examination of a smear alone is of practically no value unless followed by cultivation and study of the micro-organism. Differentiation in his own cases has been carried out by a consideration of the following points: growth at room temperature on agar, hæmoglobin-agar, gelatine, blood-serum, potato, bouillon, and litmus milk, together with a comparison of the action of the organisms on the sugars and of their length of viability. The micrococcus catarrhalis is so easily differentiated that the question really turns upon the distinction between the gonococcus, on the one hand, and the meningococcus, on the other. Briefly,

the last-named organism grows on agar, blood-serum, potato, bouillon, and litmus milk. Both grow on hæmoglobin-agar, but the colonies differ in appearance, the gonococcus forming fine, slightly raised, moist-looking, colourless growths, and the meningococcus large, raised, profuse growths, which have somewhat of a bluish tinge. McKee feels convinced that hæmoglobin-agar is the most satisfactory medium for the growth and differentiation of both organisms. On the sugars, the meningococcus ferments maltose and dextrose, and the gonococcus dextrose alone. The viability is much less in the case of the meningococcus than in that of the gonococcus. Strains differ in detail, but the cultural features of the two micro-organisms afford, in the author's opinion, ample ground for differentiation.

McKee has seen seven cases of cerebro-spinal meningitis accompanied by ocular symptoms, namely, conjunctivitis in six instances and metastatic ophthalmitis in one instance. As regards the former, the meningococcus was found in two of the cases in culture, while in two others characteristic Gram-negative diplococci were seen in smear preparations. In all, the meningococcus was cultivated from the cerebro-spinal fluid obtained by lumbar puncture. The case of metastatic ophthalmitis occurred in a child of 7 years, who died from acute epidemic cerebro-spinal meningitis after an illness of two days. On the day prior to death hypopyon of the right eye was noticed. At the autopsy, the right cornea was seared, pus was withdrawn from the anterior chamber, and inoculated on hæmoglobin-agar, on which at 37° C. there was an abundant growth of a Gram-negative diplococcus, which agreed in every particular with the diplococcus isolated from the cerebro-spinal fluid of the patient. In other words, it was the meningococcus. Lastly, McKee has isolated the meningococcus from the normal conjunctival sac of a Jewish lad. Tubes of hæmoglobin-agar, bouillon, and agar were inoculated, and the growth on the first-named medium was so profuse that McKee at first believed that he had to do with the micrococcus catarrhalis, but subsequent tests convinced him that the micro-organism was, in reality, the meningococcus.

SYDNEY STEPHENSON.

(6) **Rosenhauch** describes six cases of eye-affections due to influenza bacilli. The first two patients were infants, aged 2 and 3 weeks respectively, who suffered from severe conjunctivitis of the blennorrhœa type. A speedy cure was effected, no corneal complications or symptoms of influenza supervening. Even a milder course was taken by a sub-acute conjunctivitis in a third child of the age of 3 months. The fourth case was one of subconjunctival abscess in the right eye of a girl who suffered from influenza. The abscess, which reached from the upper limbus to near the equator, was incised and found to contain influenza bacilli. The next observation was one of dendritic ulcer of the cornea, which appeared after a "feverish cold." The last patient, a young man, developed while suffering from influenza, right orbital abscess with exophthalmos. An incision along the upper orbital margin released an abundance of fetid pus. On examining with a probe, the frontal sinus was found to communicate with the abscess cavity, being evidently the primary seat of suppuration. The patient, however, recovered without radical treatment of the sinus. C. MARKUS.

(7) **Fischer** in a case of panophthalmitis found influenza bacilli in association with staphylococci and xerosis bacilli. This observation was the starting point for experimental researches into the behaviour of influenza bacilli within the eye. The bacillus from the case just mentioned was grown in pure culture and injected into the vitreous of rabbits, where it was found to multiply freely. Panophthalmitis resulted without fail. Injections into

the anterior chamber led to the formation of hypopyon but not to destruction of the eye. Inoculations of the cornea remained without result.

C. MARKUS.

8) **Pusey** Chicago found the bacillus pyocyaneus, together with staphylococcus albus, in serum and agar tubes inoculated from a case of sub-acute follicular conjunctivitis in a man, 29 years of age. The bacillus was also found in cultures taken from the apparently healthy conjunctival sac of a man, aged 25 years. The author comments upon the fact that the only form of conjunctivitis in which the bacillus pyocyaneus has so far been described is ophthalmia neonatorum (v. Herff, Derby, Stephenson, and Hanke and Tertsch).

MAX P.

9) The pneumococcus is, of course, the common cause of *typical* ulcus serpens, as originally pointed out by Widmark, Gasparrini, and by Uthoff and Axenfeld. In rare instances other organisms have been found—as for example, the diplobacillus liquefaciens (Uthoff and Axenfeld, Petit), a protens-like bacillus Krueger, short thick bacilli, which did not liquify gelatine, and which were pathogenic for the cornea of the rabbit (Bach and Neumann), and the pneumobacillus (Gourfein). In cases where other organisms were found, such as those reported by MacNab, Gourfein, and Paul, the typical clinical picture of ulcus serpens was not present.

It admits of no doubt, according to the researches of Petit and Paul, that diplobacilli may cause keratitis. But as regards the Rhine country, of which Bonn is the centre, **zur Nedden**, who practises in that town, insists that such is not the case, although diplobacillary conjunctivitis is very common. As some sort of explanation of the apparent indemnity, zur Nedden suggests that the disease has lost a portion of its virulence in the western provinces of Germany, as a result of its existence there for many years in endemic form.

In the course of his work at Bonn, zur Nedden has met with three cases of ulcus serpens in which he failed to find pneumococci. In the first case on smear preparations there was present the xerosis bacillus, together with heaps of Gram-negative cocci; in cultures xerosis bacilli with streptococci were found. In the second and third cases the findings were great numbers of the bacillus subtilis, along with a few adventitious colonies of sarcinae and xerosis bacilli. The subtilis organism was pathogenic for the cornea and vitreous humour of rabbits.

zur Nedden discusses the relationship of the bacillus subtilis to affections of the eye. Popłowska and Haab (1891) were the first to describe it as an organism capable of causing suppuration in the vitreous humour, and after a lapse of some years, the observation was confirmed by Roemer (1901), Baenziger and Silberschmidt (1902), and Kayser (1903). Michalski (1903) and Gourfein (1904) looked upon the organism as a cause of conjunctivitis.

The bacteriology of ulcus serpens is summed up by the author in the following way. *Typical* cases are for the most part produced by pneumococci, and much more rarely by the diplobacillus liquefaciens, Bach and Neumann's bacilli, Krueger's protens-like bacillus, the pneumobacillus, and, lastly, by the bacillus subtilis, and the streptococcus. On the other hand, in *atypical* cases, a larger number of groups of bacteria are of aetiological importance, more especially the Morax-Axenfeld diplobacillus and the bacillus of marginal ulcerations of the cornea, the so-called zur Nedden's bacillus.

SYDNEY STEPHENSON.

IV.—INTERSTITIAL KERATITIS IN ACQUIRED SYPHILIS.

- (1) Verhaeghe, D.—Interstitial keratitis due to acquired syphilis. (*La kératite interstitielle d'origine syphilitique acquise.*) *Gazette des Hôpitaux*, 77e Année, No. 118.
- (2) Davis, A. E.—Diffuse interstitial keratitis in acquired syphilis. *Journ. American Medical Association*, July 25, 1908.
- (3) Carpenter, J. T.—Diffuse interstitial keratitis in acquired syphilis. *Trans. American Ophthalmological Society*, Vol. XI, Part III, 1908, p. 581.

1. In the form of a critical review Verhaeghe (Lille) takes up the question of the diagnosis of interstitial keratitis due to acquired syphilis, as differentiated from that due to hereditary syphilis.—The result of the author's research is that certain propositions emerge from the opinions of various writers, and these propositions he puts to the proof by the close examination of the published details of 27 cases of keratitis from acquired syphilis chiefly taken from French literature. One may with advantage quote these propositions and state briefly the answers given by the test cases, namely:—*A.—Parenchymatous keratitis of acquired syphilis occurs during the secondary period, and commences during the second year after infection.*—The proposition is confirmed only in 36 per cent. of the cases. *B.—The opacity is less diffuse and more limited.*—The proposition is confirmed in 64 per cent of the cases, but this percentage includes the cases which are called by Panas "circumscribed interstitial keratitis," so that the percentage is to a certain extent misleading. *C.—It is complicated by changes in the deeper parts of the eye.*—The proposition is confirmed in 33 per cent. of the cases. *D.—The reaction is moderate.*—The proposition is confirmed in 52 per cent. of the cases: but the author points out that degree of severity of symptoms depends on the rapidity of treatment. *E.—It is unilateral.*—The proposition is confirmed in 69 per cent. of the cases, but here again the author points out that unilaterality or bilaterality may depend either upon virulence of infection or upon degree of rapidity of treatment. *F.—It yields more easily to specific treatment.*—The proposition is fully confirmed.

From all the evidence, Verhaeghe considers that it is not possible, on purely clinical grounds, to distinguish the interstitial keratitis of acquired syphilis from that due to hereditary disease. The one outstanding difference between them is that the former reacts well to treatment, the latter does not.

ERNEST THOMSON.

2) Based upon a careful study of this condition, Davis (New York City) arrives at the following conclusions.—Diffuse interstitial keratitis may occur as a result of acquired syphilis. It usually appears as a late secondary sign or during relapses in the tertiary stage of the general disease. It almost invariably affects but one eye. It runs a quicker and slighter course, as a rule, than that seen in the inherited form, and is rarely harmful to sight. True "salmon-patches" are but seldom seen. Davis has found that it is difficult to make a clinical diagnosis between the syphilitic and the tuberculous forms of the disease, even a differential pathologic diagnosis not always being conclusive. Prognosis is favourable, although it should be somewhat guarded from the fact that statistics show that sight has been lost in one case.

CHARLES A. OLIVER.

(3) Carpenter (Philadelphia) reviews the main facts concerning interstitial keratitis due to acquired syphilis, an affection of which at least 10 well-authenticated cases are now on record. The author himself has met with the

disease twice in about 7,000 private patients, and once only amongst 12,000 hospital patients. The details of these three cases (one of which followed 4½ to 5 months after a chancre of the eyelid) are included in the present communication.

1. **Symptomatology.**—Two varieties may be distinguished; *a*, general opacity of the cornea without pronounced evidences of inflammation of the uveal tract, resulting in more or less complete cure in from five weeks to three months; *b*, the "partial interstitial keratitis of Alexander," less frequent than *a*, and marked by a peripheral opacity of more or less triangular shape, invariably accompanied by severe plastic iritis. The acquired form of interstitial keratitis is usually unilateral, and may come on in a period of three weeks to twenty-three years after the initial sclerosis.

2. **Ætiology.**—A disease of adult life usually occurring between twenty and fifty years of age.

3. **Differential diagnosis.**—There is nothing, as a rule, in the clinical appearance of the interstitial keratitis of acquired syphilis to distinguish it from that due to the inherited complaint. It is only by investigation of the family and personal history, and by searching for the distinctive lesions of hereditary syphilis, that we can reach a conclusion as to the nature of the cause.

4. **Prognosis.**—As a rule, early and complete recovery can be promised.

5. **Treatment.**—The disease responds with remarkable promptitude to the administration of mercury. Potassium iodide does not appear to act so well. The local treatment does not differ materially from that of the inherited form.

SYDNEY STEPHENSON.

V.—INJURIES OF THE EYES AT WORK.

Dehenne and Baillart. — The estimation of the diminution of wage-earning capacity in injuries of the eyes at work. (*De l'évaluation de la diminution de capacité professionnelle dans les accidents oculaires du travail.* *Recueil d'Ophthalmologie*, juin, 1908.)

For the purpose of estimating wage-earning capacity after injuries of the eyes, Dehenne and Baillart divide occupations into two classes:—

1. Occupations demanding good binocular vision (mechanics, jewellers, watchmakers, etc.).

2. Occupations demanding an extensive and continuous visual field (coachmen, carters, porters, navvies, etc.).

It is evident that, according to this classification, the diminution in wage-earning capacity cannot be estimated by reference to visual acuity alone. In the case of workmen belonging to Class 1, as long as binocular vision is retained, and vision is good centrally, contraction or interruptions of the visual fields are of no great consequence. In the case of Class 2, disturbances of the visual field constitute a serious impairment in working capacity, even though central vision be practically normal.

Having decided to which class the workman belongs, the classification is of considerable help to the surgeon in forming his estimate of working capacity of the patient.

The authors find a good working guide to classification of the workmen in the wearing of presbyopic glasses. Workmen who should be referred to Class 1, when they attain the age when such glasses are generally worn) almost invariably wear presbyopic glasses at their work, while those who should be classed in the second group never do. The presence or absence of binocular vision is easily decided by means of the diploscope or stereoscope.

When one eye is normal and the vision in the other eye is reduced below $\frac{1}{2}$ binocular, vision is almost always impaired, although in exceptional cases binocular vision may be good when the vision in one eye is reduced to $\frac{1}{4}$. The authors advise that when visual acuity of one eye is suddenly lowered through accident, the re-establishment of binocular vision should be encouraged by means of exercises with the diploscope and stereoscope—if necessary a correcting glass being used for the bad eye and the vision in the good eye reduced a little, e.g., by wearing a weak + glass. The visual field should be taken for each eye separately and afterwards with both eyes open. This gives the total field of simultaneous vision and helps to expose simulation. In the estimation of wage, earning capacity, the surgeon should take into consideration:—

(i) The diminution of visual acuity. Where this amounts only to $\frac{1}{10}$ or $\frac{1}{20}$, there is no reduction of working capacity, and therefore no legal right to indemnity. In other cases the earning capacity varies with factor i, the work and on the presence or loss of factors ii and iii.

(ii) Binocular vision. This is always useful, but is indispensable in some classes of work. Its loss may mean new apprenticeship.

(iii) The extent of the field of vision for the two eyes. A full field and good simultaneous vision are always useful and any reduction constitutes an infirmity, but this is more particularly so in Class 2. The difference between the two classes is very clearly shown in cases of successful operation for traumatic cataract in one eye. To those of Class 1, it presents no particular advantage, but in the case of those in Class 2, drivers, porters, etc., it means considerable increase in efficiency of the workman.

The authors also discuss the question of the probable vision and general state of the eye before the accident, and suggest the advisability, from the employers' point of view, of having workmen's eyes examined before they are engaged. From the point of view of the workmen with imperfect eyesight, the universal adoption of this plan would be disastrous.

J. JAMESON EVANS.

VI.—EPIBULBAR TUBERCULOMA.

Lafon.—On epibulbar tuberculoma tuberculous gumma of the bulbar conjunctiva. [Le tuberculome bulbaire gomme tuberculeuse de la conjonctive bulbaire.] *Ann. d'Oculistique*, T. CXL, p. 108, août, 1908.

In 1904 Lafon, of Périgueux, described under the name of "tuberculoma" of the conjunctiva a case of tuberculous conjunctivitis differing from the commonly described forms of that disease, and since then articles on the subject have been published by Gallemerts and Calderiro.

Lafon in the article under review gives *resumés* of the histories of 18 cases of the condition which he has found recorded, and from a study of them he constructs a description of the disease, of which the following is an abstract:

1. *Pathological Anatomy*.—The lesions consist of scattered follicles which have lost their typical structure and are surrounded by tissue formed by proliferation of the connective tissue cells. Most of the cells are necrosed and caseous areas are numerous. Thrombosed capillaries and larger blood vessels, with walls thickened from vegetative endarteritis, are present. Tubercle bacilli are rarely found in sections. The development takes place more slowly than that of the miliary form, and the conjunctival epithelium

resists infection until its substantia propria is completely destroyed, but the sclerotic is easily attacked and may be perforated, leading to secondary infection. The point of origin of the condition has been variously regarded as situated in the conjunctiva, the sclera, or the uveal tract, but the author comes to the conclusion that it is in the episcleral tissue. 2. *Etiology*.—In 68 per cent of the recorded cases the age of the patients was less than 20 years, and in 66 per cent the sex was male. Hereditary tuberculosis is noted in a few cases but, as a rule, the family history is omitted. Personal histories are recorded in 16 cases. In thirteen of these there was clinical evidence of tuberculosis, while in seven of them definite pulmonary lesions were present, making 43 per cent., as compared with 6 per cent. of pulmonary lesions found by Grunet in 69 cases of tuberculous conjunctivitis. 3. *Pathogeny*.—From the large proportion of cases (81 per cent.) in which there was pre-existing general tuberculosis, from the deep origin in the episcleral tissue, and from the usual commencement 2 mm. from the limbus at the seat of anastomosis by fine capillaries between the palpebral and the anterior ciliary arteries, the author considers that the infection is endogenous. 4. *Symptoms*.—The onset of the disease is insidious. At first a red patch is noticed on the conjunctiva, usually 2 to 4 mm. from the limbus, which develops into a small red swelling and may be accompanied by pain. This develops into a round or oval clearly-defined painless rose-coloured mass of softish consistency, surrounded by a deep-red halo and having some superficial vessels running from it into the cul-de-sac. This is fixed to the sclerotic but the conjunctiva is slightly moveable over it. There is no reflex irritation or lachrymation, and the rest of the conjunctiva and the eyeball is healthy. Later, the tumour grows to the size of a pea or a cherry-stone and becomes slightly roughened and greyish, the mucous membrane loses its mobility, and ophthalmoscopically some slightly prominent white spots surrounded by a depigmented layer are found at the site of the tumour, or there may be a limited immobile retinal detachment. There is no iritis or cyclitis, but opacities may develop in the vitreous. Involvement of the glands is only recorded once, forming a contrast with miliaary conjunctival tuberculosis, where it is practically constant. The natural termination of the process consists in elimination of the necrosed tissues. The epithelium over the centre of the tumour is shed, caseous debris mixed with pus comes away through the opening thus formed, and the resulting cavity becomes slowly cicatrised, but during this process the sclera may be perforated and the eye lost from secondary infection. The following complications have been recorded: invasion of the cornea, secondary infection of the conjunctiva, perforation of the sclerotic, and panophthalmitis. Opacities in the lens have also been seen, but it is probable that they were independent. 5. *Diagnosis*.—This requires confirmation by microscopic examination and inoculation. The chief conditions with which confusion is likely are phlyctens, episcleritis (in which the nodule does not enlarge), cysticercus, malignant tumours, syphilitic gummata, and intra-ocular tuberculosis (in which iritis and cyclitis are marked and minus tension is the rule). In the ulcerated stage, the lesion may resemble a chancre, but there is no glandular enlargement. 6. *Prognosis*.—For the eye this is not very serious if treatment is adopted soon enough, but many of the patients die rapidly of general tuberculosis. 7. *Treatment*. Enucleation is contra-indicated. The tumour should be removed with a knife and the base cauterised with the galvanocautery (not the thermo-cautery which the author considers too severe) or with Vienna paste or some similar chemical escharotic.

R. J. COULTER.

VII.—FOREIGN BODIES IN THE EYE.

- (1) **Beck, A.**—On perforating wounds of the eye. *Archiv für Augenheilkunde*, August, 1906.
- (2) **Bergmeister, Otto.**—Steel splinter healed in the iris for ten years without causing irritation. *Centralbl. für prak. Augenheilkunde*, September, 1907.
- (3) **Erth, Franz.**—Copper foreign body in the vitreous with lens-images in rainbow hues. *Centralbl. für prak. Augenheilkunde*, November, 1907.
- (4) **Goulden, Charles.**—The fate of eyes that have been submitted to the operation of extraction of a foreign body by the electro-magnet. *Royal London Ophthalmic Hospital Reports*, January, 1908.
- (5) **Cirincione, Speciale.**—Fragments of stone fixed in the iris. *La Clinica Oculistica*, April, 1908.
- (6) **Warnecke.**—Double perforation of the eyeball with a pocket-knife, and implantation of a cilium and some epithelium in the cicatrix in the posterior wall of the globe. *Centralbl. für prak. Augenheilkunde*, Juni, 1908.
- (7) **Dickey, J. L.**—Piece of steel in the eye seventeen years. *West Virginia Medical Journal*, July, 1908.
- (8) **Caspar, L.**—A contribution to the knowledge of copper splinters in the eye. *Klin. Monatsbl. für Augenheilkunde*, August, 1908.

(1) The details of a hundred cases of injury to the eye are presented by **Beck** in tabular form. They were due to all kinds of foreign bodies, e.g., knives, scissors, wire, nails, wood, glass, powder. The results of the various accidents were as follows:—Four patients retained full vision. In thirty-five instances evisceration or enucleation became necessary, and in nine others phthisis bulbi set in; of the remaining fifty-two persons, ten retained V. $\frac{6}{60}$, and twenty-five finally saw less than $\frac{6}{60}$. Iodoform injections were tried in thirteen cases with but indifferent success. Sympathetic ophthalmitis occurred once, and it is worthy of note that enucleation of the injured eye was performed eight days after the accident, and sympathetic inflammation began fourteen days after the operation. PERCIVAL J. HAY.

(2) In this case a young man, *ætat.* 28 years, came to **Bergmeister** (Vienna) complaining of inflammation of the right eye during the last few weeks. There were signs of iritis, and a small foreign body could be seen up and in on the iris. The patient said that ten years previously he had got a small piece of steel in that eye, and the surgeon who treated him at that time particularly called his attention to it, but as the eye remained quiet and of perfect visual power, he had never worried about it. However, it was now decided to remove the foreign body, and this was successfully done. It was examined chemically and physically, and found to give the reactions of iron. The eye has maintained perfect vision. There was no sign of siderosis, or of any other damage to the eye. A. LEVY.

(3) On examining the eye of a patient who came to have a squint operation done, **Erth** (Klagenfurt) found a cystoid cicatrix of the ciliary region and a dirty-greyish opacity of the lens, behind which could be seen a small foreign body. The patient then stated that he had sustained, $1\frac{1}{2}$ years previously, a perforating wound of that eye as the result of a small cartridge exploding. On illuminating from the side the image from the posterior surface of the lens stood out in the brightest rainbow colours. The anterior image could be seen in the same colours but not so bright. With the ophthalmoscope, the greyish opacity of the lens disappeared completely, and the fundus

became brightly illuminated. The foreign body, removed through a scleral incision by means of iris forceps, proved to be a bit of copper.

A. LEVY.

4 Between 1901 and 1905 inclusive, 118 cases of iron or steel foreign bodies in the eye were submitted to the operation of magnet extraction at Moorfields.

Forty-two cases were carefully examined by **Goulden** or else by different ophthalmic surgeons in the country. Thirty-eight could not subsequently be found. In 38 cases the injured eye was excised. In 67 the left eye was injured and in 49 the right. One patient was a woman. In 2 cases the other eye had been excised previously for a similar accident, while in 6 cases the foreign body could not be removed.

The cases are given in detail. The conclusions come to from a study of them show that if the foreign body was anterior to the vitreous and the lens uninjured, none gained less than 6/12 vision and no eye was excised. Even if the foreign body was in the vitreous, which it had gained by going through the front of the eye, then cases were more favourable than when the foreign body was embedded in the lens. The cases giving the best results were those in which the foreign body entered the globe by the sclerotic, or in which the piece was removed by a scleral incision. The list of excision cases supports the fact that damage to the lens is an extremely serious complication.

C. DEVEREUX MARSHALL.

15 **Cirincione** points out that splinters of stone are more frequently held in the iris than any other foreign bodies. Such splinters give rise to slight and fugitive disturbances, which disappear without grave risk to the eye. They may remain for a long time without causing any functional disturbance of the eye. If, however, there be any diathesis, such as a syphilitic or tuberculous, the inflammation is likely to be severe, and will not recede without extraction of the foreign body.

HAROLD GRIMSDALE.

6 **Warnecke** reports from Fehr's *klinik* the case of a man who while using his pocket knife let it slip and it flew up and cut open his eye clean across the cornea and the sclera for 2 mm. to 3 mm. from the corneal margin. Nothing could be seen of the lens. V.=p.l., with good projection. The wounds were cleansed and sewn up, and for a time the eye seemed to do well, but later increased tension and pain necessitated excision. The eye was examined microscopically, and there was found a perforating wound at the posterior pole which had healed irregularly and at one point in this wound a cilium with its root and a polypoid excrescence of epithelial structure springing from it.

A. LEVY.

8 **Caspar** describes a case in which a piece of copper penetrated the sclerotic near the limbus and became firmly embedded in the vitreous, where it was visible up and upwards surrounded by hæmorrhage and exudate. The eye tolerated the foreign body for more than a year, during which time the vitreous became clearer and vision improved considerably ($\frac{3}{60}$), but after that inflammation set in. Enucleation, however, which seemed imperative, was avoided by a successful attempt at removing the splinter. Under deep general anaesthesia, after the formation of a conjunctival flap and a meridional scleral section, an iris forceps was introduced into the vitreous repeatedly. On the fifth attempt the splinter came away. Ophthalmoscopic examination during the operation did not prove of much assistance in this instance, as it was impossible to see the face, eyes, and foreign body at the same time. The inflammation disappeared gradually; fifteen months after operation the eye was quiet with vision $\frac{3}{60}$ and some delicate fibrous strands passing across the vitreous.

C. MARKUS.

VIII.—HETEROCHROMIA OF THE IRIS.*

Lutz, A.—On some cases of Heterochromia iridum. (Ueber einige Fälle von Heterochromia iridum.) *Zeitschrift für Augenheilkunde*, März and April, 1908.

Lutz Zurich summarises the literature on the subject, which is mostly gathered from English sources. He then gives the clinical history of 17 cases of the condition associated with a diseased condition of one eye, and of six cases where there was no obvious disorder apart from the different colour of the two irides. In the first series, which are grouped in tabular form, all the paler eyes were diseased, and the usual malady was a form of cyclitis of a well-defined type, characterised by fine keratitis punctata and exudate into the vitreous. There is practically never any injection of the eye. There are never any evidences of lymph in the pupillary area; adhesions do not form. Cataract is frequent, but its extraction is generally successful. The final prognosis is, however, unfavourable. The progress is insidious and chronic. The heterochromia in healthy eyes generally dates from birth. Lutz found no evidence that the condition was an inherited one, but it was usual to find that one eye was like the mother's eyes, the other like the father's. The condition is not associated with general disease, but a large number of the patients had simple albuminuria, which in some cases disappeared. There is also evidence of disease of the sympathetic in some of the cases. A considerable anisometropia is not infrequent. The paper is a valuable contribution to our knowledge of the subject. T. HARRISON BUTLER.

IX.—PARALYSIS AFTER COCAINISATION OF THE SPINAL CORD.

Schepens, L.—Paralysis of the sixth pair after cocaineisation of the spinal canal. (Paralysie de la sixième paire après rachicocainisation.) *La Clinique Ophthalmologique*, 25 novembre, 1908.

Schepens reports in full a very interesting case of sixth nerve palsy following cocaine anaesthesia by lumbar injection, quotes the literature on the subject, and examines various authors' views as to the cause of the phenomenon.

On the fourth day after injection of 3 centigrammes of cocaine, a woman of 52 years began to complain of photophobia and vertigo, on the ninth day of peculiar sensations in the limbs, and, when seen by Schepens five weeks after the operation, she was found to have complete paralysis of the left, and incomplete paralysis of the right, external rectus. Field of fixation, 10° outward for left eye, 30° for right eye. Pupils, visual acuity, and fields of vision normal. After nine weeks there was no change in the condition. Careful physical examination revealed considerable diminution of surface sensibility (but no complete anaesthesia), weakness of the limbs, vertigo with eyes open or closed, feeble heart and rapid pulse, mental depression, and insomnia.

There is nothing in the history to explain this paralysis (of the sixth). Patient is married and has nine children living out of twelve. She has prolapsus uteri, wears a pessary, and formerly suffered from hemorrhoids which were operated upon under the spinal anaesthesia which has given rise to the symptoms.

Thirty cases have been reported, from which the following facts emerge:—

- (1) These palsies may be produced by any of the anaesthetics, novocaine, stovaine, etc.
- (2) They never appear at once, but from the 4th to the 40th day.
- (3) Twenty-nine times out of thirty the sixth nerves have been affected, once the fourth, and once the third and sixth.
- (4) In the great majority of cases the left nerve is affected.
- (5) In general, the prognosis is favourable.
- (6) The affection is not so rare, perhaps, as has been supposed.

Various hypotheses have been suggested to explain the facts:—

- (1) Haemorrhage in the nucleus following lowering of pressure (Adam).
- (2) Toxic action (Mühsam).
- (3) Elective action, comparable to that of lead in producing wrist-drop (Loeser).
- (4) Elective action on the nerve periphery (Lang).
- (5) Slight meningeal infection (Blanluet, Caron, Morax).
- (6) Ach thinks that substances injected into the spinal canal pass only very slowly up it, thus explaining the late onset. He also observes that the affected nerves are delicate and have a long course through the cerebro-spinal fluid. The anaesthetic or its decomposition products only reach the base of the brain after several days and then they act on the roots of the nerves, causing a kind of neuritis.
- (7) Gerstenberg thinks that the anaesthetic acts directly on the sixth nucleus at the base of the fourth ventricle.

Schepens admits that none of these hypotheses is proved. There has been no autopsy on any case. Experiments on animals have given no definite result. The question of the cause of this definite set of symptoms after lumbar anaesthesia must be left to the future for solution.

ERNEST THOMSON.

X.—OCULAR COMPLICATIONS OF VARICELLA.

Rolleston, J. D.—Palpebral gangrene and other ocular complications of varicella. *Medical Chronicle*, January, 1909, Vol. XVI, p. 215.

Serious ocular complications in varicella are extremely rare, but a slight degree of ocular involvement is not uncommon. In 150 cases of chicken-pox observed by Rolleston (London) in the course of six years, the eyes were affected in 13, or 8.6 per cent. In 10 there was catarrhal conjunctivitis. In 4 of these there was palpebral oedema, resembling that so frequently seen in small-pox, and in one considerable chemosis. In only two was the conjunctiva actually invaded by the eruption, a single pock being situated in each case on the palpebral conjunctiva. The ocular conjunctiva was not affected in any case. In 3 cases the lids were affected—2 of blepharitis and 1 of palpebral gangrene. The palpebral gangrene occurred in a boy, aged 16 months, suffering from concurrent scarlet fever and varicella. On admission to hospital, in addition to the rash of scarlet fever, he showed a discrete eruption of desiccating varicella vesicles, one of which was situated just above the right external canthus and had been irritated by scratching. There was considerable palpebral oedema. The next day the oedema was less, but a patch of gangrene starting from the irritated pock had begun to appear. Two days later the whole cutaneous surface of the lower lid was involved. On separation of the necrotic area, the fibres of the orbicularis palpebrarum were exposed. Adenitis of the anterior auricular and submaxillary glands developed, the submaxillary adenitis ending in suppuration. For a few days there was considerable constitutional disturbance. Complete cicatrization gradually occurred, and only a slight degree of ectropion resulted. Bacteriological examination of the gangrenous area showed

staphylococci and streptococci. Treatment consisted, at first, in dusting the gangrenous area with iodoform, and, later, in the application of sodium citrate, and sodium chloride compresses, and in syringing the wound with the same lotion, with five grains of sodium citrate internally (Wright).

There was no history of tuberculosis in this case. The occurrence of gangrene is attributed to the association of scarlet fever which often exercises a malign influence on chicken-pox. There are only three other cases on record of palpebral gangrene following varicella. AUTHOR'S ABSTRACT.

XI.—ULCUS RODENS CORNEÆ (MOOREN'S ULCER)

Hayashi, M. On rodent ulcer of the cornea. Ueber das Ulcus rodens Corneæ.) *Klin. Monatsbl. f. Augenheilkunde*, November-Dezember, 1908.

Hayashi reports four cases of Mooren's ulcer, in which the characteristic features of this rare disease were well-marked: severe pain, chronicity, intractability, healing of the ulcer in the periphery keeping almost pace with the advance of the central undermined edge. Careful bacteriological investigation remained without result, in so far as no peculiar germ was discovered. A specific bacterial infection is, however, thought most probable. The microscopical examinations of sections showed (a) in the periphery: a thickened, irregular epithelium, sending projections into the subjacent tissue, absence of Bowman's membrane, granulation tissue composed mostly of lymphocytes, and containing numerous blood-vessels and hemorrhages, a layer of only slightly changed corneal tissue, intact Descemet's membrane and endothelium. In the region of the ulcer (b) itself: epithelium and Bowman's membrane are absent, a similar granulation is met with leucocytes preponderating, the corneal tissue is densely infiltrated, especially towards the centre, where fresh tissue becomes invaded and undermined. The clear cornea (c) shows degenerative changes of its epithelium, which are slight in fresh, but well-marked in more advanced, cases.

CASE 1. Peasant, aged 34, badly nourished, but without organic disease. When first seen, the right eye alone was affected; only the lower fourth of the corneal periphery was free from ulceration, the uninvaded centre already slightly opaque. Small hypopyon. V. fingers at 20 cm. The ulcer spread in spite of subconjunctival injections of mercuric perchloride and peritomy. Galvanic cauterisation led to extensive leucoma, which became slightly clearer subsequently. Two years after the beginning of the disease in the right eye, the left became affected. A small, gray, dot-like infiltration appeared in the outer border of the cornea, a similar infiltration, ten days later, up and in. Eye much injected. The infiltrations increased and gave place to a circumscribed ulcer. Subconjunctival injections of five per cent. sodium chloride, application of mercuric perchloride one to one thousand, and tincture of iodine failed. The small remnant of uninvaded cornea was then removed with Graefe's knife; pain and inflammation ceased, cicatrization set in; process ended with vascularised leucoma. V. fingers 50 cm. Clearing up of leucoma to be expected.

CASE 2.—Healthy woman, aged 60. R. well marked arcus senilis. L. much injected, painful, and tender. Sickles-shaped marginal ulcer up-m, undermined central edge; arcus senilis above and below. In spite of "all available remedies," the ulcer spread and became nearly circular. Small hypopyon. A transplanted flap of conjunctiva became necrotic. Enucleation on account of intolerable pain.

CASE 3. Peasant woman, aged 40, in good health. Bilateral affection, the left eye becoming implicated one month after the right. R. big marginal ulcer, peripheral cicatrization, gray infiltrated undermined central edge. Transplantation of conjunctiva successful. V. fingers at one metre. L. began with dot-like infiltrations up-m, going on to spreading ulcer. The whole diseased part, with a layer of subjacent normal tissue, removed. Complete cure. V. 2.

CASE 4. Peasant woman, aged 50, of weak constitution but without organic disease. R. slight arcus senilis, normal. L. colera of lids, pericorneal injection. Typical ulcer in lower-outer periphery. Subconjunctival injections of mercuric perchloride, cauterisation, application of auro-camphorvaseline, mercuric perchloride, etc., failed. Enucleation on account of pain.

The only English paper mentioned by the author is Davidson's "Radium in the Treatment of Rodent Ulcer" (cancer of the skin!). The nomenclature explains, but hardly excuses, such an error. C. MARKS.

XII. SYMPATHETIC AFFECTIONS OF THE EYE.

1. Moretti, E.—Sympathetic ophthalmia in young persons under age from the standpoint of sanitary laws. *Annali di Ottalmologia*, Vol. XXXV, fasc. 7 to 9.
- 1A. Roure. — Phenomena of sympathetic irritation consecutive to subluxation of the lens. (Phénomènes d'irritation sympathique consécutifs à la subluxation du cristallin.) *Ann. d'Oculistique*, I. CXXXV, p. 135.
- 1B. Le Roux. Perforating wounds of the eye. Foreign bodies and sympathetic ophthalmia. (Traumatismes perforants de l'œil. Corps étrangers et Ophtalmie sympathique.) *L'Ophtalmologie Provinciale*, mars, 1907. T. III, p. 179.
- (2) Fromaget.—Sympathetic serous uveitis: secondary acute glaucoma and myopia. *Annales d'Oculistique*, avril, 1907.
- (3) Santucci, S.—Sympathetic ophthalmia in relation to the theory of cyto-toxins. *Annali di Ottalmologia*, Vol. XXXVI, fasc. 3-4.
- (4) Stieren, Edward.—Sympathetic ophthalmia. *Pennsylvania Medical Journal*, October, 1907.
- (4A) McIlroy, Janie Hamilton.—Sympathetic ophthalmia: some anatomical considerations, with special reference to the occurrence of plasma cells. *Royal London Ophthalmic Hospital Reports*, Vol. XVII, Part 2.
- (5) Parisotti.—Experimental research on the nature of sympathetic Ophthalmia. *Riv. Ital. di Ottal.*, May, 1908.
- (6) Woodruff, H. W.—Migratory ophthalmia in its relation to injuries of the globe. *Journ. Ophthalmology and Oto-Laryngology*, June, 1908.
- (7) Brose, L. D.—Sympathetic ophthalmia. *Lancet-Clinic*, July 11th, 1908.
- (8) Troussseau.—Sympathetic ophthalmia after removal of the anterior segment of the eye. *Annales d'Oculistique*, juillet, 1908.
- (9) Valude.—The time for enucleation in sympathetic ophthalmia. *Bull. et Mém. de la Société Française d'Ophtalmologie*, 1908, p. 205.
- (10) Kalt.—A peculiar case of sympathetic ophthalmia following an injury to the eye. *Bull. et Mém. de la Société Française d'Ophtalmologie*, 1908, p. 211.
- (11) Mathewson, Geo. H.—Sympathetic ophthalmia occurring thirty-one days after the removal of the injured eye. *Ophthalmic Record*, November, 1908.
- (12) Campbell, Don M.—Post-operative sympathetic ophthalmitis. *Ophthalmic Record*, November, 1908.
- (13) Brobst, Chas. H.—Sympathetic ophthalmia following Mules' operation. *Ophthalmic Record*, November, 1908.
- (14) Gifford, H.—On sympathetic ophthalmia after evisceration and Mules' operation, with a case. *Ophthalmic Record*, November, 1908.
- (15) Oliver, Charles A.—Clinical history and histologic study of a case of transferred ophthalmitis, following the insertion of a gold ball into the scleral cavity—enucleation—recovery with useful vision. *Ophthalmic Record*, November, 1908.

(1) **Moretti's** communication, which contains interesting considerations on the question of sympathetic ophthalmia in general, led to the proposal, before the Sanitary Association of Milan, to add to the sanitary laws the two following articles:— (1) Every time that a medical man called to attend a person under age, finds a trouble in one eye which certainly or probably is due to a lesion, recent or old, traumatic or idiopathic, active or extinct, in the fellow eye, such medical man is bound to make immediate and regular declaration thereof. (2) The proper authority must appoint for each chief town of a province, a permanent College of Experts comprised of three medical men with a competent knowledge of ophthalmology, who shall examine the young patient and give their therapeutic advice and opinion, to which the father or guardian must always conform.

These proposals of Moretti were inspired by two truly distressing cases in his practice—a girl of twelve years and a child of two years afflicted with severe sympathetic ophthalmia, and completely and irreparably blind on account of the refusal of the parents to permit enucleation. **A. ANTONELLI.**

(1A) **Roure** considers that subluxated lenses may, by rubbing against the iris, set up sympathetic mischief, and that they should therefore be extracted. He has been able to find only two cases recorded in which this complication has occurred, but quotes four from his own practice in support of his contention. **R. J. COULTER.**

(1B) **Le Roux** records two cases of sympathetic ophthalmia occurring respectively 10 months and 4 months after penetrating wounds in children aged 6 and 11 years. In both cases the onset was insidious, and, owing to the freedom from pain and inflammation of both the injured and the sympathising eyes, the parents did not become aware of the danger until the disease had made considerable progress. **R. J. COULTER.**

2 **Fromaget's** patient, a boy, aged 11 years, met with an accident which caused a wound of the cornea and ciliary region, with incarceration of the iris and ciliary body. Eighteen days later, he developed sympathetic ophthalmia, which commenced as a retino-choroiditis, and ran an acute course. The exciting eye having been enucleated on the twenty-first day after the injury, the condition of the sympathiser improved so much that it was apparently cured, and the patient was discharged, only to return ten days later with a typical acute glaucoma, which gradually subsided under treatment with eserine. After three months, when the glaucoma was finally cured, the eye, which had previously been emmetropic, was found to have developed myopia of 6D, while its vision was reduced to one-half by a deposit on the anterior lens capsule.

The author considers that the increased tension was due to (1) alteration in the internal secretion of the eye, and (2) obliteration of the posterior filtration channels, and that the onset of the glaucomatous symptoms was delayed until the stretching of the eyeball, evidenced by the development of myopia, had reached a maximum. **R. J. COULTER.**

(3) After a good *résumé*, with bibliography, of the history of the question, **Santucci** (Rome) offers an original contribution to the study of sympathetic ophthalmia. To the ætiology of this disease he applies the theory of cytotoxins—that is, of serum having an elective toxic action on such and such an organ of the economy. Just as there are renal, ovarian, &c., cytotoxins or autocytoxins, there may be ocular cytotoxins; and Santucci endeavours to demonstrate this by inoculation experiments (on rabbits) with emulsions of healthy eye tissue introduced under skin or conjunctiva, or with emulsions of tissues of an animal's eye which has been severely wounded and is more or less phthisical. These long and laborious investigations are not yet sufficiently

numerous, even in the opinion of the author, who makes this communication early in order to allow the theory to be definitely established. But their results are conclusive enough to encourage other studies in the same direction which may determine the aetiology of sympathetic ophthalmia by autoeytotoxins.

A. ANTONELLI.

(4) As the result of personal observation and study, **Stieren** (Pittsburg) finds that eyes which are the most likely to produce sympathetic ophthalmia are those in which there have been wounds in the ciliary region; those in which there are extensive anterior synechiae following corneal ulcer; those containing a foreign body; those in which there is a plastic uveitis ending in ossous degeneration; and, finally, those in which there has been a uveitis ending in bulbar phthisis or atrophy.

C. A. O.

(4A) First of all, an elaborate abstract is given by **McIlroy** of Fuchs' paper on sympathetic ophthalmia, published in Graefe's *Archives* in 1905. After that the authoress gives an account of her own work, which, on the whole, is confirmative of Fuchs' description of sympathetic inflammation, but with some exceptions in the case of the sympathising eye, which, however, really was not included in Fuchs' paper. With regard to cell formation, epithelioid cells were infrequent, lymphocytes were abundant in most cases, giant cells were absent only in one, plasma cells were exceptionally numerous in all, and delicate fibroblasts were found in the exudates of several. The cellular infiltrations were usually in patches consisting chiefly of plasma cells. It is in the sympathising eye that the plasma cells were most abundant, and these cells were always more abundant in sympathetic than in non-sympathetic cases.

C. DEVEREUX MARSHALL.

(5) In these researches, **Parisotti** (Rome) has examined the percentage of solids in the aqueous humour of eyes which had been subjected to injury and of the fellow eyes; and compared the amounts with those of normal eyes. He finds that one of the results of any injury is to raise the albuminous matters in the aqueous of both eyes. There is, that is to say, some change set up in the fellow eye, which expresses itself by the increase of the albuminous material; what this change is, is still to seek. Parisotti inclines to think that it lies in a disturbance of the epithelium of the ciliary body.

H. GRIMSDALE.

(6) Since Mackenzie called attention to sympathetic ophthalmia, perhaps no subject in ophthalmology has aroused greater interest or given rise to more discussion. Statistics, especially those from the Hirschberg *klinik*, go to show that the disease is less common now than was formerly the case. At the Illinois Charitable Eye and Ear Infirmary from 1859 to 1906 there were 109,454 patients, and of that number 108 (0.054 per cent.) were affected with sympathetic disease. **Woodruff** (Joliet, Illinois) concludes that so-called "migratory ophthalmia" is to-day a rare disease. It is relatively commoner in children than in adults. The author agrees that it is more liable to follow wounds in the ciliary region—the "dangerous zone" of Nettleship—than in other parts of the capsule of the eye. Retained foreign bodies are especially dangerous. Upwards of one hundred cases are on record as following the operation for cataract. Preventive treatment should include, among other things, the legal prohibition of dangerous toys, the instruction of parents with regard to the management of their own children, and, lastly, dissemination of knowledge among the laity as to antiseptics and aseptics. Large doses of sodium salicylate, as recommended by Gifford and Gradle, among American authors, are endorsed as a method of preventing irido-cyclitis in cases of serious injury not demanding immediate enucleation. The value of mercury, too, is well-established in these cases. With respect to the vexed question of the treatment of the exciting eye, Woodruff finds his indications in the two

points, tension and vision—for instance, he would sacrifice an eye, the projection of which was poor and the tension lowered.

SYDNEY STEPHENSON.

(8) **Trousseau's** (Paris) patient had an operation on his right eye for complicated cataract, followed by prolonged pain, which necessitated a second operation 18 months later. As this did not relieve him, the anterior segment of the eyeball was removed, with a view to rendering the other eye quite safe, but when seen by Trousseau, seven weeks later, there was definite sympathetic ophthalmia. The remains of the right eyeball were removed, and under treatment with atropine, mercury, and a lacto-vegetarian diet, the inflammation subsided, and the vision, which had been so bad that the patient could scarcely find his way about, increased to one-third. Microscopic examination of the excised eye by Ducloux showed, in addition to the appearances usually found in exciting eyes, a sheath of cells around the veins in the papilla, extending to the lamina cribrosa, but not beyond it. Trousseau, while admitting that his case might have recovered without removal of the stump, expresses his firm conviction that enucleation is the only operation which is justifiable on an exciting eye, and that every other intervention on such an eye tends definitely to set up sympathetic inflammation. R. J. COULTER.

(9) **Valude** (Paris) sums up his position with regard to the treatment of injured eyes in the following way.—To be very radical before the advent of sympathetic mischief, sacrificing all suspicious and blind eyes. On the contrary, to be very conservative when dealing with a wounded eye which possesses useful sight and to retain it at all price. Valude speaks well of the subconjunctival injections of sublimate, recommended originally by Abadie, in the treatment of sympathetic cases.

SYDNEY STEPHENSON.

(10) **Kalt** (Paris) reports the following case.—A woman of 44 years developed sympathetic ophthalmitis about a month after an injury to the other eye, which was enucleated as soon as Kalt saw the patient. Despite this intervention, the sympathising eye was much worse when examined three days later. The conjunctival wound of the enucleated eye was opened up, the optic nerve found, and a third of a cubic centimetre of mercury cyanide, 1: 3,000, was injected into its sheath. Three days after there was a surprising improvement in the state of the sympathising eye, and the attack appeared to be vanquished. But seven days later there was a glaucomatous attack, which yielded to iridectomy. At the end of about three weeks there was a severe irido-cyclitis, which did not yield to cyanide injections made into the orbital tissues nor to exenteration of the contents of the orbit on the side of the exciting eye. In spite of various kinds of treatment, the sight of the sympathising eye was irretrievably lost at about the end of a month.

SYDNEY STEPHENSON.

(11) Thirty-one days after the removal of an eye with panophthalmitis the patient, a man of 42 years, whose case is reported by **Mathewson** (Montreal), returned with complaints that his remaining eye had been red, painful, and dim for one day. On examination, anterior uveitis, vitreous opacities, and vision reduced to counting fingers at ten feet. The optic disc was normal. Discharged, after a stay in hospital of thirty-seven days, with vision of 6/36. Sight (corrected) some six months after commencement of attack was 6/12. Treatment was by atropine and hot fomentations locally. Inunctions of mercury, injections of pilocarpine, and hot baths were also given.

SYDNEY STEPHENSON.

(12) **Campbell** (Detroit) believes sympathetic ophthalmitis to be due to systemic invasion from the exciting eye. In his opinion, this theory is supported by: 1. the existence of a special pathological change in the exciting

eye. Fuchs; 2. the clinical evidences of a mild general infection, as evidenced by constitutional depression, malaise, anorexia, moderate rise in temperature, quickening of the pulse-rate, great pain around the exciting eye, and a peculiar pricking sensation in the branches of the ophthalmic division of the V nerve; and 3. the success of treatment by sodium salicylate, which produces, according to Campbell's investigations, what may be described as a medicinal leucocytosis. In reference to the last point, the salicylate should be administered in accordance with Gifford's instructions—namely, *one grain of the drug per pound of the patient's bodily weight a day*. As to post-operative sympathetic ophthalmitis, the condition is not extremely rare, although it is true that the literature does not contain many records of such cases, probably owing to the natural reluctance of surgeons to place such cases on record.

Campbell relates six cases of sympathetic ophthalmitis which he has met with in a practice extending over twenty years. In abstract, they are as follow:—

1. Sympathetic disease came on between three and four weeks after a scale of iron had been removed with the Hirschberg magnet from the interior of an eye. Result, blindness. 2. Three weeks after an ineffectual attempt to remove a bit of gun-cap from the vitreous of a lad, 10 years of age, sympathetic mischief supervened, and led to complete blindness. 3. Four weeks after extraction of senile cataract and prolapse of iris, sympathetic ophthalmitis. Useful sight retained in both eyes. 4. Mules' operation when aged 4½ months on account of anterior staphyloma resulting from ophthalmia neonatorum. Healing uneventful. After several attacks of irritation, sympathetic ophthalmitis, under the guise of optic papillitis, occurred when the child had reached the age of 3½ years. There was at the time inflammatory reaction in the stump. The latter was enucleated, the child placed in a dark-room, and sodium salicylate was given. Recovery prompt, complete, and permanent. 5. Five weeks after a penetrating wound of the sclero corneal margin, with prolapse of the iris and opacity of the lens, the wounded eye was enucleated. In the meantime, the iris had been freed, and a small iridectomy performed. Exactly three weeks after enucleation, the patient returned with plastic irido-cyclitis, synechia, and seriously reduced vision. Complete recovery under sodium salicylate. 6. Perforating wound of cornea and traumatic cataract produced by a splinter of wood. Three weeks after injury swollen lens matter evacuated. No improvement. Injured eye accordingly enucleated. Three weeks after last named operation, fellow eye became inflamed, and when examined a few days later, showed a violent plastic irido-cyclitis. Recovery perfect under sodium salicylate.

Finally, Campbell makes two suggestions: first, that a modification of transillumination might enable us to recognize the changes now known to occur in the uveal tract of the exciting eye; and, secondly, that blood examinations might yield useful results. SYDNEY STEPHENSON.

(13) Ten hours after an incised wound of one eye **Brobst** (Peoria, Ill.) eviscerated and placed a glass ball in the scleral cavity of a lad, aged ten years. Patient discharged from hospital after a stay of one week. Fifty-nine days after the operation, there was sympathetic optic neuritis, and V. of 20/60. The stump of the eye that had been operated on was also tender and congested. The stump was at once removed, and cyanide injections were made into the optic nerve. V. of 20/20 was eventually regained 164 days after the original operation. SYDNEY STEPHENSON.

14. A singularly unfortunate case has led **Gifford** (Omaha) to enquire closely into sympathetic ophthalmitis as it may follow various substitutes for enucleation, such as Mules' operation, Frost's operation, and simple evisceration. The result is a communication which should be pondered by every ophthalmic surgeon.

The case was as under:

On or about September 15th, 1903, the patient, a man aged 45 years, received a penetrating wound in the sclera, and when examined by Gifford six weeks later, the condition of the eye was such that an atypical Mules' operation, with insertion of glass sphere, was performed soon after (December 17th). On July 28th, 1904, irido-cyclitis of the remaining eye, with vision 20/100. No signs of irritation as regards the stump. The latter was enucleated, and under treatment with sodium salicylate, the other eye recovered almost normal sight. On January 29th, 1905, acute glaucoma, relieved by iridectomy. In the following June, tension again rose slightly, and sclerotomy was performed, an operation repeated in the following September. In June, 1906, exudation in anterior chamber, and cornea nearly all of a yellowish hue. When last seen, in 1907, phthisis bulbi.

Mules' operation.—Gifford has collected sixteen cases of sympathetic ophthalmitis following Mules' operation (Cross, Coleman, Bettmann, Charney, Bickerton, Suker, Carrow, Thomson, Byers, Ziegler, Goldberg, Sherman, Brobst). **Frost's operation.**—Three cases of sympathetic ophthalmitis after Frost's operation have been collected, *viz.*, those by Cant, Lang, and Sattler, and one of sympathetic irritation by Davis. **Simple evisceration.**—Gifford has brought together nine cases of sympathetic ophthalmitis following simple evisceration, namely, those reported by Dransart, Schmidt-Rimpler, Waldispühl, van Duyse, Forget, Hotz, Nieden, and de Wecker. Besides these, an instance of sympathetic amblyopia following ordinary evisceration has been reported by Burchardt, and two instances of sympathetic irritation by Casey Wood and Suker respectively.

Commenting upon the figures brought out by his analysis, Gifford points out that in most cases operation was performed on account of persistent inflammation following a wound of the eye. It might be argued that sympathetic mischief might have occurred even if simple enucleation had been practised. But in seven of the cases (Carrow, Lang, Gifford, Forget, Schmidt-Rimpler, Cant, and van Duyse) this explanation cannot be reasonably applied. Considering the immense preponderance of simple enucleation as compared with the substitute operations, Gifford believes that "enucleation as a prophylactic against sympathetic ophthalmia is somewhat surer than any operation in which part of the eyeball or any foreign body is left in the orbit or scleral cavity." "I think it is also certain," he continues, "that ordinary or simple evisceration is safer than Mules' or Frost's operation."

With regard to the severity of the disease, Gifford gives the following figures:— 1. *After Mules' operation*, vision of 20/30 or better was obtained in nine cases; in two the final vision was 20/60 and 20/80 respectively; in two it was not known; while in two the sight was nearly destroyed. 2. *After Frost's operation*: outcome uncertain in one, V. was 6/10 in the second, and fingers at four feet in the third case. 3. *After ordinary evisceration*, normal sight regained in two, in one V. 6/8, in three V=O, and in three unknown.

Gifford concludes an important communication with the following striking words: "To be frank, I do not think that my own practice would be much influenced by this series of cases if they were reported by someone else, but having had one of these accidents myself, I should feel like a criminal if I were to go on doing Mules' operation or Frost's operation, and should have a second patient go blind after one of them; and I should throw over the simple evisceration also, if I did not believe it to be slightly less likely to cause death than enucleation is."

SYDNEY STEPHENSON.

(15) **Oliver** (Philadelphia) reports the following case:—

A middle-aged miner was struck in the right eye by a piece of coal, and the fragment was removed from the anterior chamber on the third day after the accident. Three weeks later, Mules' operation was performed, and seven weeks later, the left eye became inflamed. On examination by Oliver, stump tender, movements impaired, and conjunctival sac filled with granulation tissue. The other eye showed "a classical picture of transferred ophthalmitis." V. not recorded. The stump, together with its contained glass sphere, was enucleated. Under vigorous treatment, which included the administration of large doses of sodium salicylate, in two weeks' time the left eye became free from "all active and gross signs and symptoms," although sight was merely perception of light, and the pupil was small and irregularly dilated. A series of operations led eventually to qualitative vision, and the patient's fundus could be seen with the ophthalmoscope. Four years later "the patient enjoyed useful sight." The enucleated stump, which was examined by Harold G. Goldberg, showed that the much thickened sclera was infiltrated with leucocytes, while the optic nerve was much swollen and thickly infiltrated with leucocytes. The central artery was plugged with leucocytes. The sheath was thickened, and the lymph spaces were packed with mononuclear leucocytes. No neural structures were found. Smears from the interior of the stump showed no bacteria, but those taken from the nerve sheath disclosed one string of four small oval cocci, which stained by Gram.

SYDNEY STEPHENSON.

XIII.—SANGUINEOUS LACRYMATION.

de Micas. True and false tears of blood. (Les vraies et les fausses larmes de sang : Étude clinique sur les hémorrhagies de la conjonctive.) *Recueil d'Ophthalmologie*, novembre, 1908.

de Micas describes a singular case of conjunctival hæmorrhage in a boy, aged 12 years. With the slightest or no provocation, tears of blood in great abundance appeared in his eyes and overflowed on to his cheeks and objects in his hands. This occurred several times a day for over three months, so that the youth lost his appetite and became pale and weak, and he and his family naturally became alarmed. The patient was regarded as a hæmophilic. With the help of adrenalin drops, de Micas was able to find out that the blood came from the tarsal conjunctiva, which was covered with numerous fine papillæ. The patient also suffered from epistaxis and small purpuric patches on the tongue and buccal mucous membrane, and from which blood oozed frequently. His mother had similar patches on the lips and tongue.

Instillation of a solution of glycerine of tannin, and massage of the conjunctiva with boric powder, and tonics and ergotine internally, gave no relief. The bleeding was eventually stopped by touching the papillary conjunctiva with the thermo-cautery, and the patient then speedily recovered his appetite and health. The author discusses the question of true tears of blood, by which he means the secretion of blood by the lacrimal gland, and not the admixture of ordinary tears with blood in the conjunctival sac, as in the case described above.

de Wecker doubted the possibility of true tears of blood, but Panas was inclined to admit their possibility and Damalia records many cases from literature, some of which, at any rate, may be regarded as idiopathic tears of blood, although many of them are undoubtedly cases of conjunctival hæmorrhage. de Micas, whilst not denying their possibility, is of opinion that cases of genuine tears of blood must be extremely rare.

Extra-conjunctival hæmorrhage may be due to accident, operation, or therapeutic agents, e.g.: silver nitrate, tumours of the conjunctiva, conjunctival ulcerations, or fine delicate papillæ, or the blood may transude through an apparently sound conjunctiva.

By way of treatment, the actual cautery or astringent collyria, and especially protargol, are most efficacious.

J. JAMESON EVANS.

XIV. THE LACRYMAL PASSAGES.

- 1 Montano, Emilio F. The ætiology of affections of the tear ducts. *Annales de Ophthalmologie*, August, 1905.
- 2 Galindo, J. Refugio.—Ætiology and treatment of diseases of the tear ducts. *Mexican Ophthalmological Society*, 1905.

- (3) Burdon-Cooper, J.—A silkworm gut lacrymal style. *Ophthalmic Review*, January, 1907.
- (4) Evans, J. Jameson.—The lacrymal sac in the economy of vision. *British Medical Journal*, February 23, 1907.
- (5) Parsons, J. H.—A clinical lecture on the treatment of lacrymal obstruction. *British Medical Journal*, February, 23, 1907.
- (6) Shumway, Edward Adams.—Ocular infections due to disease of the conjunctiva and the lacrymal passages. *Pennsylvania Medical Journal*, July, 1907.
- (7) Addario, C.—A contribution to the surgery of the lacrymal passages. *Annali di Ottalmologia*, 1907, fasc. XXXVI.
- (8) Koster, Gzn., W. and Kan, P.Th. T.—A new method of treating some chronic diseases of the tear passages. *Ned. Tijdschrift voor Geneeskunde*, 1907, 11.
- (8A) Osolin, J.—A case of dacryocystitis cured by an intercurrent facial erysipelas. (Ein Fall von Tränensack-Eiterung, geheilt durch interkurrentes Gesichtserysipel.) *Centralbl. f. prak. Augenheilkunde*, Dezember, 1907.
- (9) Fergus, Freeland.—Lacrymation: its cause and treatment. *Glasgow Medical Journal*, April, 1908.
- (10) Tyson, Henry H.—A case of unilateral congenital fistula of the lacrymal sac, with a review of the literature. *Archives of Ophthalmology*, July, 1908.
- (11) Curdy, R. J.—Recurrent traumatic erosion of the cornea—report of a case due to lacrymal stricture. *Annals of Ophthalmology*, October, 1908.
- (12) Moulton, H.—The treatment of strictures of the nasal duct with lead styles. *Journ. American Medical Association*, October 10, 1908.
- (13) Harman, N. Bishop.—A successful lacrymal syringe. *Ophthalmic Review*, December, 1908.

(14) **Montano** discusses the various theories explaining the passage of tears through the lacrymal channels: ascribing it to a physiological condition: the theory of aspiration, by the vacuum produced in the nose by inspiration, or according to Richet, by the action of the orbicularis of the eyelids, which at each wink dilates the sac: or, as Foltz says, by the action of closing the eyelids, which produces a kind of passive systole in the tear sac, which by its own elasticity returns to the diastole. He rejects these theories, and noting the anatomy of the tear channels, the rapid widening of the bore of the canaliculi at the level of the sac and the general direction of the channels, he concludes that capillary attraction is the only force that drives the tears through their excretory ducts. He bases his theory on the following experiment: a capillary tube, one of whose ends is immersed in a liquid while the other is

rapidly and amply widened, requires no biological force to absorb the liquid, the physical force, which is called adhesion and which produces the phenomena of capillary attraction, is sufficient. He shows some glass tubes, similar in shape to tear ducts, by means of which he demonstrates the actual passage of a liquid through them by capillary attraction alone. He then studies the aetiology of diseases of the tear channels, which he ascribes to causes that destroy capillary action, or oppose the free passage of the liquid through the outgoing canal. These diseases he treats of at length.

URIBE Y TRONCOSO.

(2) **Galindo** holds the same ideas as those expressed in the foregoing work, and presents, as his own invention, an *Automatic Irrigator* for the tear ducts. It consists of a steel band, fitted to the patient's forehead and held in place by an elastic band. The steel band has two supports, right and left, with a sloping ring to hold the irrigator tube without pressing it. At the end of the tube may be placed any one of the nozzles of Anel's syringe. The height of the irrigating flask may be changed at the will of the surgeon. Once in its place, the apparatus works without being watched, and allows the patient to move without getting out of its place.

URIBE Y TRONCOSO.

(3) This variety of style is used by **Burdon-Cooper** (Bath) in cases of obstruction of the lower end of the lacrymal duct. His details for its insertion are somewhat elaborate, and, of course, the canaliculus has to be slit. After it is passed, the lower end is made to project from the nostril, and this and the other end are tied together, thus forming a loop. The next day "the gut is cut on the cheek, and the upper end burnt by means of a hot needle, and a small knob of sealing wax fixed on to it. The upper end of the style is bent to a right angle, the short horizontal part lies in the slit canaliculus when the style is drawn into position. The lower end, after having a knob of wax fixed to it, is inserted within the nostril." A silk style can now be attached to the gut style, and be pulled through and changed as often as required.

C. DEVEREUX MARSHALL.

4 **Evans** (Birmingham) enters into the physiology and pathology of lacrymation, and describes the method of excision of the sac. His incision commences below the internal palpebral ligament, which is left intact. Indications for the operations are stated.

ERNEST THOMSON.

(5) **Parsons** (London) deprecates the use of probes. In unprobed adult cases, *daily* syringing of the sac (only) results in cure in the majority of cases. If a case does not yield to this treatment, the sac is excised.

In young infants the sequence is simple conjunctival lotion with frequent finger pressure on the sac, syringing of the sac, careful passing of a fine probe once only; and, lastly, if none of these succeeds, excision of the sac.

ERNEST THOMSON.

(7) The work of **Addario** (Palermo) is in three little chapters as follows:—

1. Exploratory incision and the open method of treatment of some cases of dacryocystitis.

2. The treatment of cases of congenital dacryocystitis, and some points in their aetiology (nasal affection, diploccoccus capsulatus).

3. Excision of the lacrymal sac, the author's *technique* (a modification of the methods of Kuhnt, Czerniak, and Axenfeld; incision on the anterior lacrymal crest).

A. ANTONELLI.

(8) Many chronic suppurations, strictures, and fistule of the tear passages do not yield to any treatment; therefore in some cases we must have recourse to complete removal of the tear sac. Yet some of these patients might be cured without that mutilation, if we had a method of permanently draining

the sac. The *sond à demeure*, sometimes used, did not give entire satisfaction. Koster succeeded in getting permanent drainage by passing a silk thread through the canal, and catching the end protruding from the opening of the canal with a small hook, leading it out of the nostril, the end hanging over the cheek from the canaliculus and the end protruding from the nostril are knotted together, thus preventing the thread from slipping out of the canal. One half of the thread is hidden in the tear passages, the other lying on the patient's cheek. The thread is left in position for some weeks, and every day the portion lying in the tear passage can be drawn out and cleansed. Koster records the *historia morbi* of a number of patients in whom this method yielded excellent results. The *technique* of the insertion of the thread is somewhat difficult, and is therefore described at length. First, a hollow probe is inserted in the ordinary way in the duct, then a thin metal thread doubled up to form a loop is passed through the hollow probe till the end of the loop is visible in the nose. The end of the loop is caught with a small hook and a silk thread is inserted in the loop. Then, the metal thread is drawn back through the probe, taking with it the silk thread, which in this way is drawn from the nose upwards in the duct till the end appears in the canaliculus. Lastly, the two ends of the thread are knotted after removal of the hollow probe.

G. F. ROCIAT.

(8A) **Osolin** (Dorpat) recounts the curious case of a young man who had for many years bilateral dacryocystitis which, in the left eye, became phlegmonous with the formation of a fistula. He was treated with sounds and with syringing for some time without any benefit, and it was then decided to remove both sacs. The left was operated on and cleaned out, and as he was recovering from this, he developed a severe attack of facial erysipelas. The old fistula, now converted into a sinus, discharged small quantities of sero-sanguineous matter, and healed only after prolonged treatment. The erysipelas was very severe and lasted nine days, and, later, when the patient was almost well, he noticed that he could no longer squeeze any pus out of the right sac as he had been accustomed to do for many years, and on investigation the tear passages were found to be perfectly normal, fluid passing easily, no strictures and no epiphora, and on examination three months later, this was still the case, and so the cure may be regarded as permanent.

A. LEVY.

(9) **Fergus** (Glasgow) summarizes as follows:— "On no account should the canaliculus ever be slit in dacryocystitis. Such an operation is nothing less nor more than a piece of very bad and crude surgery. As well might you divide up another organ from its external meatus to its membranous position for stricture in this latter situation. Probing should be little resorted to. A fine probe may be passed so as to insure that the fluids with which you hope to cleanse the pyogenic membrane find their way into the nasal cavity. . . . Large probes should never be used. . . . It is steadily to be kept in mind that in dacryocystitis we are dealing primarily with a septic mucous membrane and not with a stricture. No drug that can be used is bactericidal, so that if drainage and washing do not avail to remove the septic condition, then probably the best line of treatment is the destruction of the sac, either by caustic or by extirpation. It seems to me that a man who uses a very large probe has entirely failed to grasp the pathological condition: he makes the radical mistake of regarding the primary condition as a stricture, whereas in reality it is a septic mucous membrane."

ERNEST THOMSON.

(10) A child of 21 months presented a capillary opening, of oval shape, over the centre of the right lacrymal sac. The canaliculi and the duct, as tested with fluorescein, were patent. On the first or second day after birth,

water had been noticed to run from the tiny hole. No history of inflammation of the conjunctiva, eyelids, or lacrimal sac. A nevus was present in the left parietal region. **Tyson** New York succeeded in closing the lacrimal fistula by touching it with the galvano-cautery. **SYDNEY STEPHENSON.**

(12) **Moulton** Fort Smith, Arkansas has found that the best lead wire from which to make styles is that which is used by electricians, the contained antimony rendering it firmer than the ordinary varieties. The most suitable sizes range from one to two millimetres in diameter. The one to be employed should be either of the same size as or slightly smaller than the largest probe which has been previously inserted. From a long experience, the author speaks favourably of the plan. **C. A. OLIVER.**

13 **Harman's** is an improvement on the ordinary lacrymal syringe, having a very perfectly fitting metal plunger which is so loose as to be able to fall by its own weight and yet so accurately does it fit that no air gets in at all. It depends upon the fact that in this solid metal plunger there is a narrow circular groove which holds a cushion of air and prevents regurgitation, but allows of perfect freedom of motion by the piston. **C. DEVEREUX MARSHALL.**

XV.—RETINAL DISEASE WITH MASSIVE EXUDATION.

Coats, George.—**Forms of Retinal Disease with Massive Exudation.**
Royal London Ophthalmic Hospital Reports, Vol. 17, Part III, November, 1908.

These cases form a fairly well-defined group, but usually the most careful clinical examination fails to discern any probable aetiology, so no certain diagnosis can be arrived at. Pathological records are very scanty. **Coats** London has recently examined six cases, and in this contribution gives the result of his investigations.

The first specimen was from a woman, aged 37, whose sight in the affected eye had been failing for six months. There was massive exudation in the retina, which at one spot extended far forward into the vitreous; the retinal vessels ran over it and were grossly affected. On pathological examination, the white area projecting into the vitreous was found to be due to a mass of *débris* situated between the retina and choroid. The clot was undergoing organisation. The retina was degenerated. Vascular changes occurred in three forms: 1. dilatation with little change in the wall; 2. thickening and degeneration of the wall with narrowing or obliteration of the lumen; 3. the vessels were ensheathed with leucocytes. The exudation seen elsewhere in the fundus was not due to retinal disease but to a collection of leucocytes in the subretinal fluid beneath a flat detachment.

The second case was in a man, aged 26, quite healthy, with no evidence of venereal disease. He had eruptions of acne each spring and autumn, and it was thought likely that this was the origin of infection. The left eye was normal. The right eye diverged. There were enormous masses of opaque creamy looking material in every part of the fundus except up and in. Numerous vascular changes were visible in the retinal vessels. The changes found pathologically were similar to the first case, but more advanced. There was also evidence of iritis and secondary glaucoma.

The third case was in a boy, aged 7, who had in the y.s. region of the right eye a dense white mass with pigmented edges. The centre was

raised 3 D. There was exudation all over the fundus behind the retinal vessels. On microscopic examination, a mass of fibrous tissue was found in the outer layers of the retina, which was engorged and contained lime salts, and as it was known to have been present for four years, it represented the final stage of the conditions present in Case I. The anterior part of the eye showed evidence of iritis and secondary glaucoma, as in Case II.

The fourth case was in a boy, aged 8, whose right eye had been divergent for four years after an attack of measles. A mass was seen, resembling a detached retina, above the disc and another above the macula. The eye was excised, and the anterior part was found to be healthy. The massive exudation was due to an extensive sheet of fibrous tissue similar to that found in the other cases. It was of old standing, and organisation had gone so far as to form bone. It showed, as usual, an intimate connection with the retina and comparatively loose adhesion to the choroid. Cholesterin and giant cells were present, but there were no hæmorrhages.

The fifth case was in a girl, aged 26, whose right eye had vision of 5/60, and with correction 6/36. There were vitreous opacities, a tag of tissue projected from the disc, and the lower quadrant of the fundus had a large mass apparently in the choroid; the central portion was swollen and showed a good deal of retinal hæmorrhage. Fresh hæmorrhages appeared and the mass was getting larger. The eye was excised. In this case the exudation was more localised and more pigmented than in Case IV. The fibrous tissue between the retina and choroid was far advanced, though it contained no bone. It showed the same close connection with the retina and slight connection with the choroid. All anterior structures were normal.

The sixth case was in a man, aged 32, who never remembered having seen with his left eye. It became painful and was excised. The iridic angle was blocked. The retina showed changes practically identical with those in Case V. Neither cholesterin crystals nor recent hæmorrhages were present. There was much folding of the retina due to cicatricial contraction.

Coats divides his cases into three groups:—1. those without gross vascular disease; 2. those with gross vascular disease; and 3. a peculiar group, perhaps related to these two, in which there is a formation of large arterio-venous communications.

1. In the first group physical examination nearly always revealed no other disease, the family history was negative, and the disease was very slow in development, even as long as 9 years in a case recorded by Snell, and in many other instances the eye was probably blind years before the patient was aware of the fact. Other illustrative cases from literature are then given.

2. In the second group the average age was about 21 years, and males were more frequently attacked than females. The general health was usually perfect, and the history of the onset varied considerably. The most characteristic sign of the disease was the occurrence of extraordinary forms of vascular disease, especially in the smaller branches of the vessels, whose calibre was fusiform or beaded, minute expansions occurred by the side of the vessels, and some of the arteries terminated in small knobs. The veins were even more affected than the arteries. Except for the vascular changes, the other characteristics were essentially the same as in group 1.

3. In the third group is a series of very peculiar and obscure cases, though no instance occurred in Coats' six cases. The first was described by Fuchs in 1882. The average age of the patients is 22.5 years and the male sex predominates. It is frequently bilateral. The general health is usually perfect and the family history negative. There is gigantic enlargement of the retinal vessels, up to 3–4 times their normal size, and they are very

tortuous. It is very difficult at times to distinguish between an artery and a vein, and this is due to the intercommunication between the two.

Four cases have been examined pathologically and they have similar characteristics to those of the other two groups but with enormously dilated and thick-walled vessels.

The possibility of tubercle being the origin of the exudation is discussed, but there are many points against it, and in no case have tubercle-systems or caseation been found. Of syphilis there is no evidence. The explanation which best suits these cases is that of a slow organization of hæmorrhage, and both clinical and histological evidence support this idea. This was particularly well seen in Case I, and if organizing hæmorrhage is the true explanation, these cases are brought into near relation with retinitis proliferans. The changes which occur subsequent to the hæmorrhage are very carefully discussed.

The third group resembles somewhat closely the second, and this is especially so pathologically, but from the few pathological examinations that have yet been made of cases of this nature it seems wiser at present to classify them separately.

C. DEVEREUX MARSHALL.

XVI.—REMEDIES.

- (1) Hirschberg, J.—Congenital buphthalmos treated by sclerotomy; good result after sixteen years. Angeborene Augen Wassersucht durch Lederhautschnitt operiert; guter Erfolg nach 16 Jahren festgestellt. *Centralb. für prak. Augenheilkunde*, Juni, 1907.
- 2 Bjerrum, J.—A contribution to the therapeutics of glaucoma. (Ein Beitrag zur Therapie des Glaukoms.) *Centralb. f. prak. Augenheilkunde*, August, 1907.
- 3 Miró.—On the psychogenic nature of blepharospasm. Sulla natura psicogena del blefarospasmo. *La Clinica Oculistica*, May, 1908.
- 4 Antonelli.—Paraspecific serumtherapy in severe injuries of the eyeball. (Séro-thérapie paraspécifique dans les traumatismes graves du globe oculaire.) *La Clinique Ophtalmologique*, octobre, 1908.
- 5 Bettremieux.—Lacrymal neuralgia. (La névralgie des larmoyants; un cas de tic douloureux de la face guéri depuis 11 ans.) *La Clinique Ophtalmologique*, 10 novembre, 1908.
- 6 Chevalier, G.—The treatment of facial neuralgia by local injections of alcohol. (Traitement de la névralgie faciale par les injections locales d'alcool.) *La Clinique Ophtalmologique*, novembre, 1908.
- 7 Vavsek, Emil.—The treatment of serpiginous ulcers with the galvanocautery. (Therapie der serpigenosen Hornhautgeschwüre mit dem Galvanokauter.) *Zeitschrift f. Augenheilkunde*, Dezember, 1908.
- 8 Grossmann, Karl.—Fibrolysin in ophthalmic practice. *Lancet*, January 10th, 1909.
- (9) Danis, Marcel.—Oily and anæsthetic collyria. Collyres huileux et anesthésiques. *La Clinique*, 23 janvier, 1909.

- (10) **Bailliant.**—The treatment of muscular paralyses of the eye. (*Traitement des paralysies musculaires de l'œil.* *Bull. gén. de Thérapeutique*, 30 janvier, 1909.
- (11) **Motais.**—The treatment of ophthalmia neonatorum by protargol. (*Traitement de l'ophtalmie des nouveau-nés par le protargol.* *L'Ophthalmologie Provinciale*, janvier, 1909.
- (12) **Gendron.**—The general treatment of phlyctenular ophthalmia. (*Traitement général de l'ophtalmie phlycténulaire.* *L'Ophthalmologie Provinciale*, janvier, 1909.
- (13) **O'Malley, Austin.**—A suggestion for the treatment of ophthalmia neonatorum. *Journal American Medical Association*, January 23rd, 1909.

(1) **Hirschberg** (Berlin) reports the following case.—In 1891, a child one year old, was brought to him suffering from enlargement of the left eye, with steaminess of the cornea, dilatation of the pupil, and increased tension. This was treated with eserine for eight days without result, and so a double sclerotomy was performed with an immediately successful result. The child was seen at intervals and for the last time at the age of 17 when the eye was in exactly the same condition as it had always been. There had been no increase in the corneal diameter and no raised tension, and vision was much the same in both eyes—about $\frac{2}{40}$. The child was of very feeble mental development.

A. LEVY.

(2) To the various methods of performing sclerotomy for glaucoma, **Bjerrum** (Copenhagen) adds another, which he first practised accidentally owing to the bending of a very thin Graefe knife, and the markedly beneficial effects of which induced him to repeat it in other cases. It consists essentially in making the counter-puncture some distance, 4-8 mm., behind the corneal margin, instead of close to the cornea as usual. The puncture is made in the usual situation about 2 mm. behind the cornea, the knife, a somewhat long stiff-backed Graefe, with a double cutting point, is carried across the chamber and made to emerge well back in the angle of chamber. It is not necessary to perforate the conjunctiva at this point. The aqueous is allowed to escape through the counter puncture. Before withdrawing the knife, the incision is somewhat widened. Prolapse of the iris sometimes occurs at the point of puncture, and may be removed. Occasionally the iris is buttonholed by the knife, but this does no harm. At the point of counter-puncture a small, black, thin scar generally forms, and filtration goes on permanently. Many cases are cited, both of chronic glaucoma and of buphthalmia, where this procedure gave relief. The reasons for the increased benefit from this operation may be due to the following facts: 1. division of the periphery of the iris; 2. division of the insertion of the ciliary muscle; 3. opening of the suprachoroidal space; 4. perforation of the sclera at a point where it is exceptionally thin.

A. LEVY.

(3) It is admitted that some forms of spasm are central in origin, and **Mirto** holds that blepharospasm is frequently of this nature. He gives the history of two patients in whom he concludes the spasm to have been central. In both, treatment had no permanent effect; even the injection of 80 per cent. alcohol, containing cocain, as recommended by Valude, was followed by relief only corresponding to the paralysis of the facial, and the spasm recurred with recovery of power. In neither of Mirto's patients was there any ocular cause to be found. He is therefore led to believe that, in the absence of any reflex, the cause was a central one.

HAROLD GRIMSDALE.

(4) **Antonelli** (Paris) adds his words of praise of the Roux serum in severe ocular trauma. It does no harm, often does good, and, at any rate, relieves

pain and promotes sleep. The article is a general recommendation of this treatment and contains no case-histories.

ERNEST THOMSON.

5) **Bettremieux** (Roubaix) first of all relates the case of a patient who suffered from spasmodic right facial neuralgia. This man had been operated upon about 13 years previously by Alfred Leplat, who had resected the alveolar border with only transitory effect. Bettremieux discovered that the permeability of the tear passages was defective on both sides, and that lacrymation had been especially marked during the attacks; the passages were therefore catheterized and washed out. In a few weeks all symptoms had disappeared. Two years later, there was a slight attack of tic, which yielded again to catheterism and injections of antiseptics. Since then (1899), the patient has remained free from attacks. Thereafter, the author goes into the subject of tic douloureux and its treatment in general. He proposes the description *névralgie des larmoyants* for those cases of tic in the region of the fifth nerve, which are caused by a pathological condition of the lacrymal passages.

ERNEST THOMSON.

6) **Chevalier** speaks quite confidently about the method, perfected by Schloesser, of Munich, of injecting alcohol into the branches of the fifth nerve in order to bring about degeneration. The alcohol in 80 per cent. strength is injected into the branches at the points where they emerge from the skull. The author gives in detail the anatomical positions of and guides to the various foramina. Local anesthesia is first produced by the injection of 1 per cent. stovaine in order to facilitate deep exploration with the point of the syringe needle, through which, when the nerve has been located by the pain caused in pricking it, the alcohol is then injected. The author warns the beginner that he may fail to find the nerve, and advises him never to proceed to the alcohol injection until he is satisfied that he has pricked the nerve with the point of the syringe needle, since if the alcohol fails to reach the nerve it will only increase the patient's immediate pain without any permanent result. The stovaine which has been injected will, on the other hand, give temporary relief and so the patient's confidence is to a certain extent gained, and another attempt may afterwards be made. It is said that after this treatment—which sounds rather difficult of execution—the pain subsides for six or eight months, then reappears and must be treated anew. Eventually recurrences become rarer and finally cease.

Schloesser's method was introduced into France by Ostwalt¹ and has been enthusiastically employed by Levy and Baudoin² and by Brissaud, Sicard, and Tanon.³

In connection with this interesting subject reference may be made to THE OPHTHALMOSCOPE, 1908, pp. 126, 645, and 777, where the use of alcohol injections in the treatment of spasms of the facial muscles is discussed.

ERNEST THOMSON.

REFERENCES.

- (1) Ostwalt. *Académie de Médecine*, mai, 1905.
- (2) Levy and Baudoin. *La Presse Médicale*, février, 1907.
- (3) Brissaud, Sicard, and Tanon. *Société Médicale*, juillet, 1907.

7) **Vavsek** (Prague) after discussing the whole subject, concludes that: 1. Cauterization of a serpiginous ulcer is the best means of arresting its progress. 2) The cauterization must be performed as soon as the ulcer shows signs of spreading. 3. Any ulcer which begins to show the characteristic signs of a serpiginous ulcer must be regarded as serious and malignant in nature, for at present we have no means of deciding upon the violence of the infection, nor can we from the clinical appearance prophesy the result of

the disease. (4) Those situations where the infiltration affects all the layers of the cornea or extends to the limbus must be very thoroughly cauterized. (5) Opening the anterior chamber with the cautery has no advantage over the keratome operation. (6) When the hypopyon is inspissated and not very high, paracentesis is contraindicated. (7) If the lacrymal sac secrete much pus the sac must be extirpated at once. (We would suggest that if *any* pus be present in the lacrymal apparatus the sac be at once dissected out.) (8) After extensive cauterization, the patient must keep very quiet for a long time, for perforation may occur even in the third week.

T. HARRISON BUTLER.

(8) Fibrolysin, a combination of one molecule of thiosinamine with half a molecule of salicylate of sodium, is a white, crystalline, soluble substance, with a bitter taste. It decomposes on exposure and is therefore put up in tubes of brown glass in doses of 2·3 cubic centimetres of a 15 per cent. aqueous solution, equivalent to three grains of thiosinamine. Fibrolysin causes cicatricial fibrous tissue to become looser, and the scar to become relaxed. This is supposed to be due to serous infiltration or flooding of the tissue fasciæ rendering them more readily amenable to absorption by the increased lymph stream.*

Grossmann (Liverpool) has tried the drug in ophthalmic practice, and more particularly in a case of scalding of the left side of the face and eyelids. Photographs show that the left upper eyelid was drawn upwards by a broad cicatricial band which interfered with its motility and it was evident that further cicatricial contraction was to be expected. There was a corneal ulcer, and after this healed injections of fibrolysin were commenced. The first injection (subcutaneous in upper arm) was of one cubic centimetre; three days later the full dose of 2·3 cubic centimetres was given, and this dose was continued at fairly equal intervals for about six weeks, when the tenth and last injection was given. The result was very surprising. The lower eyelid soon became quite normal in appearance, and equally so the left side of the forehead and of both hands. The left upper eyelid, instead of undergoing the shrinkage which ordinarily would have taken place, became more moveable and normal in appearance, the thick band in the central part gradually softening and thinning, so that the eyelid when open had practically a normal appearance. Photographs show the contrast in the appearances of the eye, open and closed, before and after the treatment. These photographs are exceedingly good witnesses for the author's statements.

Grossmann was encouraged by the above-noted case to try fibrolysin in retrobulbar neuritis and in corneal opacities, but he is unable to be sure whether good results were or were not attributable to fibrolysin. A good result was obtained in a case of lacrymal stenosis.

Disagreeable symptoms, which may occur after injection of the drug, are a burning sensation and discolouration at the site of injection, and the formation of a hard nodule of the size of a cherry which may take weeks or months to disappear. Also there may be headache, etc., and Urbantschitsch mentions a case where regularly about twelve hours after each injection menstruation occurred. In another case epistaxis occurred. (Edema glottidis has been known to follow the injection. Anomalies of general sensation may occur. The drug should not be used in arterio-sclerosis in elderly patients. The cases where serious symptoms have presented themselves emphasise the necessity of beginning with a small dose, such as 0·50 or 1 cubic centimetre. The time of menstruation should, as far as possible, be avoided.

ERNEST THOMSON.

*For an account of this singular product see THE OPHTHALMOSCOPIC, 1908, p. 794.

9. **Danis** (Brussels) has employed collyria with chemically pure olive oil as the menstruum, and has experimented with the solutions in Gallemaerts' *dentique*. In this way he has tried alypin, acoin, cocain, atropin, and eserin. As regards alypin, Danis utilized the base, which is an oily liquid, since alypin itself is insoluble in oily media. A 5 per cent. solution of the base kept so well that at the end of two months it did not redden blue tourmesol. A minute after this collyrium had been put into an eye, foreign bodies could be removed from the cornea without pain. After the lapse of two minutes, anæsthesia was sufficient to allow the cornea to be scraped; and the condition lasted for from 14 to 16 minutes. A 1 per cent. oily solution of acoin, like that of alypin, must be prepared from the base, but as an anæsthetic it is inferior to other agents. As regards 2 per cent. oily solution of cocain, anæsthesia is obtained more quickly than with a watery one, while dilatation of the pupil comes on more quickly (9·5 minutes) in the one than in the other case (13·5 minutes). The author concludes, as the results of his experiments, that oily solutions of alypin and cocain present the following advantages over the corresponding watery solutions: 1. They keep longer, both from a chemical and a bacteriological point of view; 2. Their action is more rapid and more durable.

SYDNEY STEPHENSON.

10. **Baillart** recommends treatment of the cause (most often syphilis), electricity, and exercises of the affected muscle. In addition to this, it is advantageous to employ, two or three times a week, an injection into the temple of 1 milligramme of strychnine sulphate. Surgical measures are to be adopted only when the other means have failed. In the last resort an attempt is made to combine the two images by means of prisms.

SYDNEY STEPHENSON.

11. **Motais** (Angers) reports ten cases of ophthalmia neonatorum treated with protargol. The following is the method employed:—the eyes are washed frequently with absorbent cotton saturated with a warm solution of potassium permanganate (0·25 to 1,000 gr.). If the eyelids show a tendency to become agglutinated, their edges are touched with iodoform-vaseline, 2 per cent. 20 per cent. protargol is dropped into the eye every six hours in mild cases and every three hours in severe ones. The protargol is allowed to fall over the cornea, whether the latter be ulcerated or not. As matters mend, a weaker solution (0·50 to 5 grammes) of protargol is used until cure is complete. In cases where the cornea is ulcerated, Motais uses atropine, in addition to the protargol. Finally, in nine of the cases reported by Motais the gonococcus was present in the conjunctival secretion, and the same organism was possibly present in the tenth case, despite the fact that several days after treatment had been commenced, the pneumococcus was found.

SYDNEY STEPHENSON.

12. **Gendron** (Lorient) attaches as much importance to the hygienic and general treatment of phlyctenular affections of the eye as to the local treatment. Many of the cases, he believes, are made worse by a stay at the seaside, a change which should not be ordered, under any circumstances, until acute symptoms have disappeared. In "scrofulous" and "lymphatic" children the best remedies are cod-liver oil, the preparations of iodine or arsenic, or, as recommended by Panas, iodoform mixed with powdered coffee, in order to disguise the smell and taste of the iodoform. As tonics, the author recommends bitters, quinine, and chlorophosphate or glycerophosphate of lime. In his hands, yeast has been useful. In rheumatic subjects affected with phlyctenular conditions of the eye, Gendron gives alkalies, saline purgatives, and salicylates. In one such case he had remarkable results from the administration of salicylate of lithia.

SYDNEY STEPHENSON.

(13) O'Malley (Philadelphia) believes that in cases of ophthalmia neonatorum the eye first cleansed is the eye best cleansed. Accordingly, he advises the attendant to commence, say, with the right eye at one treatment, and the left eye at the next treatment. Similarly, in cases where one cornea is ulcerated, the corresponding eye should be attended to first.

SYDNEY STEPHENSON.

XVII.—ACQUIRED VIOLET BLINDNESS.

Köllner, H.—Acquired violet blindness from a clinical and physiological standpoint. *Die erworbene Violet-Blindheit vom klinischen und physiologischen Gesichtspunkte. Zeitschrift für Augenheilkunde, Ergänzungsheft. 1908.*

Köllner.—This paper, which, like many others on the physiology of vision, originated from v. Michel's clinic in Berlin, is mainly of interest to the pure physiologist, but it contains many clinical facts of great value which are perhaps not widely known.

Acquired violet blindness is strictly comparable with the congenital variety, it can be regarded as a reduction form of the normal dichromatic systems, especially deuteranopia and protanopia. Stilling believed that the blue-yellow blindness associated with chorio-retinitis was not acquired, since it too closely resembled the congenital disease, but the weight of evidence proves conclusively that the defect is in many cases an acquired one. It is observed in certain cases of *detached retina; albuminuria, diabetic, and specific retinitis; commotio retinae, chorio-retinitis, optic neuritis, glaucoma, and in retinitis pigmentosa.*

The presence of acquired violet blindness is evidence that the retina participates in the morbid process, but it does not help to distinguish one form of retinal disease from another. The determining pathological factor is probably the presence of an exudate.

It is quite certain that in many cases of the diseases enumerated, no violet blindness ever appears. A pathological, probably exudative process, in the retina can give rise to violet blindness, but does not always do so, but its presence always indicates retinal disease. The author has detected the defect in 90% of the cases of detached retina which he examined. It is not so common in the early stages, but in advanced cases it is very frequently present.

Acquired violet blindness is characterised by its patchy (*heraformig*) distribution. No complicated instruments are necessary to examine these cases, those in every well-found clinic are sufficient—the perimeter, Nagel's colour matching instrument, and the anomaloscope. The defect will be overlooked almost constantly if the patient be simply tested with Holmgren's wools or other similar tests. Congenital violet blindness is such a rare condition that it need not be considered in the differential diagnosis.

F. HARRISON BUTLER.

XVIII.—SKIASCOPY.

Schoen, W. — The nature of skiascopy. (Das Wesen der Skiaskopie. *Zeitschrift für Augenheilkunde*, November, 1908.

Schoen (Leipzig) treats the theory of skiascopy by the graphic method; his paper is illustrated by a plate which is perhaps not quite so complicated as it looks. The present contribution is a supplement to a paper he published on the same subject in the *Zeitschrift für Augenheilkunde*, Bd. XVI, 4, 315. If we understand him correctly, the theory is quite independent of the hole in the mirror, although the practice would hardly be possible without it. When the mirror is rotated, there is no alteration in the pencil of observed rays, the illuminating pencil alone alters. We are quite incorrect in talking of *shadows*. We do not see any! The dark part of the pupil which we call a shadow is merely the normal unilluminated dark pupil, the bright part is the reflex of parts of the retina which are successively lighted up as we direct the pencil of light to one or other part of the retina. The term *skiascopy* is not descriptive of the procedure. Schoen suggests *koronoscopy* from *Κορόνη*, which we find means a *sea cow* or the *tip of a brow*, a term whose application to retinoscopy we fail to comprehend: or *kraspedoscopy* from *Κράσπεδα*, a *margin*. On the whole, we confess we prefer the sound of *retinoscopy* to that of *kraspedoscopy*.

T. HARRISON BUTLER.

BOOK NOTICES.

Transactions of the American Ophthalmological Society. Forty-fourth Annual Meeting, New London, Conn., 1908. Vol. XI, Part III. Hartford: published by the Society, 1908.

This substantial volume of some three hundred pages represents the proceedings of the annual meeting of the American Ophthalmological Society, held in July, 1908, at New London, Connecticut. It contains several communications of unusual interest, which will be noticed in our columns in due course.

Transactions of the Optical Society, London. Session, 1905-1906, and Session, 1906-1907. Optician and Photographic Trade Review, 123, 124, and 125, Fleet Street, London, E.C. Price of each volume, ten shillings.

Although the contents of these volumes deal, in the main, with purely optical matters, yet there are communications not devoid of interest to ophthalmic surgeons. The first volume (1905-1906) contains an account of a discussion on optical standards, introduced by Mr. W. Salt; a paper on the theories of accommodation of the eye by Mr. Harry L. Taylor, and one on entoptic vision by Professor W. F. Barrett. The second volume (1906-1907) includes a communication by Dr. C. V. Drysdale on "The evolution of artificial lighting"; the Ophthalmometer, by Dr. W. Ettles; "one-position ophthalmometry" by Mr. John H. Sutcliffe; and "The testing of Trial Cases" by Mr. F. J. Selby.

Bericht über die Fünfunddreissigste Versammlung der Ophthalmologischen Gesellschaft. Heidelberg, 1908. Edited by A. Wagenmann, Secretary of the Ophthalmological Society. Wiesbaden: Verlag von J. F. Bergmann, 1904.

The contents of this volume, which represents the proceedings of the 35th meeting of the Heidelberg Ophthalmological Society, will be noticed individually in the columns of *THE OPHTHALMOSCOPE*. It will suffice here to say that the volume is well printed and, as usual, excellently illustrated.

Ueber den Ursprung des melanotischen Pigments der Haut und des Auges [On the origin of the melanotic pigment of the skin and eye]. By E. MEIROWSKY. Leipzig: Verlag von Dr. Werner Klinkhardt. Price 15s.

This monograph deals with the subject of pigmentation almost entirely from the dermatological point of view; indeed, apart from a few scattered references, only about a page is specifically devoted to the eye. Yet the work will merit the serious attention of ophthalmologists if it be true, as is probable, that the conclusions derived from a study of pigmentation in the epidermis and cutis are applicable in the main to the pigment epithelium and uveal stroma, and *vice versa*. The very fact that the author is a dermatologist may be said to enhance the value of the book, since a glimpse of other lands is afforded to those whose outlook is perhaps in danger of becoming somewhat contracted from too solitary a ploughing of the ophthalmological furrow.

The subject is one which has aroused interest from remote times. In the happy days before the present regrettable breach between science and theology, one was content to attribute the pigmentation of the negro to the curse of Noah on his godless son Ham. In more recent times, men of the calibre of Krause, Kölliker, Henle, and Waldeyer have been attracted to the problem. Pigment occurs in the skin in two situations: (1) in the cutis, as branched chromatophores or melanoblasts, and (2) in the epidermis, either as pigmented epithelial cells, or as branched cells whose body is usually in the most superficial layers of the cutis, while the ramifications extend among the epithelium. Two opposite explanations of the derivation of this pigment have been advanced. According to one school, it is mesoblastic in origin, being formed from the hæmoglobin of the blood, and passed into the epithelium by the pigmented cells of the cutis; according to another view, it is epiblastic, pigmented epithelial cells wandering down into the cutis. Meirowsky attacks the problem from several directions—by producing an artificial pigmentation with the Finsen light, by experiments on excised pieces of skin, and by embryological and histological methods. He comes to the conclusion that the pigment is not exclusively epiblastic or mesoblastic, but is independently formed in both layers. This is a result which will commend itself to ophthalmologists; indeed, the author might well have strengthened his case by a reference to the facts of ocular pigmentation. In the date of its appearance, for instance, the uveal pigment is separated from the retinal by nearly the whole length of fetal life; its histochemical reactions are different, as is shown by the greater ease with which it can be bleached; the structure of the cells which contain it is different; in the condition of partial albinism known as "wall-eye," pigment may be entirely absent from the uveal stroma, while the retinal pigment remains normal. The enormous development of pigment in melanotic sarcomata, which are still under the membrane of Bruch, might also have been adduced. It may almost be stated that the independent origin of the retinal and stroma pigment is a proposition which requires no further proof.

In the second portion of his work, Meiwosky seeks to determine from what particular elements of the cell the pigment is evolved. His results are chiefly founded on his experiments with the Finsen light, by which a rapid pigmentation analogous to sun-burning can be produced. With Pappenheim's stain the nucleolus, and sometimes certain other intracellular granules, are stained red with pyronin. Meiwosky finds that where pigmentation is proceeding these pyronin stained bodies are greatly increased in number; the nucleolus, or part of it, is often thrust out of the nucleus into the cytoplasm, which therefore becomes filled with granules, and under certain conditions it is these which become converted into pigment granules. Similar results were obtained in the eyes of animal embryos, but the appearances do not seem to have been so typical as in the case of the skin, and possibly this part of the work might repay repetition.

Throughout the monograph there are excellent summaries of work previously done in the same field, a full bibliography is appended, and a word of praise is due to the excellent illustrations.

GEORGE COATS.

Die Parenchymatose Hornhaut-Entzündung (Parenchymatous Inflammation of the Cornea. Von Dr. KARL HOOR, a. ö. Professor der Augenheilkunde an der Königl. Ung. Universität in Buda-Pesth. Halle a. S.: Carl Marhold. 1909. S. 124. Preis 3 M.

Hoor commences by giving a good general description of this well-known affection, dwelling upon the cloudiness of the cornea, and progressive vascularity affecting both eyes in succession, occurring most commonly in girls about the age of puberty, and presenting a tendency to recovery. He approves the term applied to it of keratitis parenchymatosa, although other designations are appropriate, as keratitis interstitialis, keratitis profunda, and keratitis diffusa. By Mackenzie it was termed scrofulous cornetitis, and by Arlt, keratitis scrofulosa seu lymphatica. By Dixon it was called, not quite correctly, keratitis syphilitica luetica, since it is not invariably associated with syphilis; and various other terms have been applied to it by other writers, both German and French, which he more or less adversely criticises. The cloudiness of the cornea, he observes, commences, in the great majority of cases, at the periphery. In 116 cases that have fallen under his own observation, only 3 cases began at the centre. This mode of origin had been described by Panas, Horner, and other observers. Careful inspection shows that differences exist in the character and disposition of the opacities, which collectively give the cloudy aspect to the cornea according to the mode in which the cornea is attacked. If, as Finck and Galezewski maintain, the haziness first appears at the centre, it presents small greyish, white, ill-defined spots in the middle and deeper layers of the cornea, which extend in various directions towards the periphery, and then become penetrated with vessels forming the salmon-coloured patch. If the cloudiness begins peripherically, it usually appears as a narrow border at the upper part, composed of striae, which coalesce, and into which vessels shoot as a general rule, but not always. The vessels are straight, and show little disposition to anastomose. The more numerous they are, the better chance is there of perfect recovery. The early, or progressive, stage is accompanied by lachrymation, photophobia, and by ciliary injection, and lasts about a fortnight; but in bad cases may extend to two months before the stage of retrogression commences. In some cases, recovery is complete; in others, some haziness of the cornea is left.

The iris, at the height of the disease, is sometimes only hyperæmic, but more

frequently it is inflamed, being discoloured and softened, with contracted pupil and deposits on the membrane of Descemet, and synechiae. The cornea retains its sensitiveness. The tension is unaltered or lowered; very rarely and only in protracted cases increased. In the early stages, the vitreous may be seen to be diffusely clouded, and the fundus presents a choroiditis anterior, characterised by the presence of round greyish spots. The vision is usually greatly impaired. Opinions differ in regard to the frequency of relapses. Stephenson found they occurred in 22 per cent., v. Hippel, Jakowlevna, and Brejski in about 17 or 18 per cent., the shortest interval being from three to four months, the longest in Karl Hoor's experience, 14 years. Hoor thinks relapses are more likely to occur when mercury has not been given. Various practitioners have given very different estimates of the frequency with which the disease affects both eyes, Breuer finding 18 per cent., and Horner 80 per cent. The proportion of males to females in 625 cases reported by several observers, was 314 females and 311 males. Stephenson found 60 per cent. females, and Cantonnet 63 per cent.

Parenchymatous keratitis occurred 3,026 times in 475,009 cases of eye disease, or in 0.63 per cent., although varying in different reports from 0.10 to 3.99 per cent.

The disease is rare before the fifth year; it is most frequent between 6 and 20. In three large statistics, the youngest patient was seven months old, the oldest was 70.

In females the affection appeared most commonly at the periods of second dentition and especially at puberty. In males it occurred most commonly from the seventh to the tenth year, but the proportion is still large from 15 to 20.

The prognosis in uncomplicated cases is favourable, but in giving it the surgeon should point out the possibility of complications and their nature, and the likelihood of both eyes becoming affected.

The aetiology of interstitial keratitis is considered at great length, particularly in regard to its syphilitic origin, and the proportion in which that condition is assigned is given from the reports of no less than 30 different authors. From these reports it appears that in 1,834 cases of keratitis there were 903, or 49.25 per cent., of congenital lues. After noting that some observers are disposed to dispute, or even to deny, the connection between keratitis interstitialis and syphilis, Dr. Hoor thinks that probably the truth lies between the two extremes, and that, in his opinion, whilst the typical interstitial keratitis is in the majority of cases caused by hereditary syphilis, yet that this does not preclude the action of other causes. It is certain that in some cases it occurs at an advanced age in persons in whom no evidence of a syphilitic taint can be discovered, and the disease is sometimes seen in animals, as dogs, horses, cattle, and goats, which are practically immune from syphilis, but, after all, it is of little importance, either from the point of view of local or general treatment. Incidentally, Dr. Hoor remarks that in making enquiries into a possible or probable syphilitic origin of any given case, the utmost discretion and tact should be exercised. Galezowski thought the syphilitic taint may be propagated from grandparents, through parents that are themselves uncontaminated. Frequent abortions, premature confinements, and still-born deliveries are suggestive. Dr. Hoor agrees generally with the value of Hutchinson's triad (deafness, malformed teeth, and interstitial keratitis), as affording evidence of hereditary syphilis. A disease that is not infrequently associated with interstitial keratitis is arthritis, which Förster thinks may be caused by a morbid process essentially similar to that affecting the cornea. As additional signs of congenital syphilis may be mentioned: 1) swollen

lymphatic (especially cervical) glands; (2) ulcers and defects of the soft palate and pharynx; (3) nodes, especially of the tibia; (4) "snub nose"; (5) rhinitis; (6) peculiar deformity of the face and skull.

Many other causes have been regarded as influential in occasioning keratitis, amongst which may be cited: influenza, gastric disturbances, malaria, various acute and chronic skin diseases, as lichen, psoriasis, urticaria hæmorrhagica, erythema exudativum, and herpes; rheumatism, amenorrhœa, diabetes, disorders of nutrition, cachexia, dyscrasia, dystrophia, infectious diseases, mumps, scurvy, myxædema, and the action of ergotin and chrysarobin and lightning stroke, the local action of cocain, sublimate, and adrenalin, for all of which authorities are given.

A brief account of the pathological conditions follows, founded upon the researches of Virchow, v. Graefe, and Leber, and Hoor records his agreement with Elschnig, namely, that the disease is essentially a degenerative process. It appears probable that the disease may follow an injury, as a result, in a predisposed person, of the vitality of the tissues being lowered.

From the nature of the disease, the treatment must be both local and general, and this must be modified in accordance with the age of the patient, and whether he is confined to his bed or not. In a hospital patient inunctions with 30 to 60 grains of mercurial ointment, four or five times a day, or, in the case of a child, 15 or 20 grains. In children, strips of mercurial plaster may be applied round the arms and thighs, or calomel in small doses may be given. In adults salicylate of mercury and vaseline may be injected subcutaneously or into the muscles, and potassium iodide ordered. When connected with rheumatism, diabetes, malaria, tuberculosis, disorders of menstruation, etc., the appropriate treatment for each affection must be pursued. For local treatment, warm fomentations and atropin drops, iridectomy, canthoplasty. Subconjunctival injections of solution of common salt and various mercurial salts should only be practised when all inflammation has subsided. Instillation of a 2 to 5 per cent. of a sterilized solution of eucain or alypin may be used.

The author appends to his treatise a bibliography of about 350 pamphlets, articles, and memoirs on this important disease, and the number of authorities he cites sometimes obscures his own opinion. Thus, in speaking of scrofulosis, he remarks that whilst Fischen, Schulek, Stilling, Gruttmann, Grünfeld, Tatzler, Loukaetis, and others consider scrofulosis as a frequent cause of the disease, Knies, Haltenhoff, and Rabl think it rarely acts as a cause, a statement that affords evidence of the author's reading, but is of little value unless the value of these authorities is known their locality indicated, and their opportunities of observation specified.

HENRY POWER.

Komplikationen der Stirnhöhlenentzündungen (Complications of Inflammation of the Frontal Antrum). By Dr. P. H. GERBER. Berlin: S. Karger, 1909. Price, 15 marks; Bound, 16.50 marks.

There is no part of the body which, though not strictly the province of the ophthalmic surgeon, so insistently comes before his notice as does the frontal sinus. Gerber's work on the subject, therefore, is just as much within the realm of ophthalmic literature as are many professedly written on our own subject.

Gerber very properly begins with a definition of terms, and adopts the name antrum for the cavity in the frontal bone. When a suppuration occurs in it he restricts the term empyæmia to those cases where there is no outflow, and pyorrhœa or blennorrhœa to those where the discharge is evacuated through the naso-frontal canal. The classification is then as follows:—

1. Antritis frontalis simplex :
 - (a) Blennorrhœa or pyorrhœa antri.
 - (b) Empyœmia antri.
2. Antritis frontalis abscedens.
3. Antritis frontalis dilatans :
 - (a) Empyœma cum dilatatione.
 - (b) Mucocele, cyst.

The term "abscedens" is used for those cases where there has been a passage through the wall of the antrum and an abscess formation under the skin.

The simplest complication of an antritis is an ostitis or a periostitis of the wall, most frequently the orbital. The complication with which the ophthalmic surgeon comes most in contact appears to be this periostitis. It can cause great changes in the orbit without actually producing a necrosis. The effects may be very slight, only a transient œdema of the lid, or a slight narrowing of the palpebral fissure on the affected side, or they may be extreme orbital cellulitis and permanent blindness. Even after the causal antritis has disappeared, the orbital cellulitis may continue, as has been shown previously by Axenfeld.

In 70 cases of periostitis, 43 showed eye complications.

Antritis frontalis abscedens (caries and necrosis).

Strange as it may seem, it appears that the rhinologists considered that bone changes were an extremely rare complication of frontal antritis. Gerber establishes the fact that they are common, and gives the credit to the ophthalmologists of having long held this to be so. In the collection of cases given, Gerber records 8 in patients under 10 years old, 1 at the age of 2. The orbital changes are sometimes very extensive.

These severe cases are those in which a differential diagnosis would be welcome, but it appears that the only points which we have to guide us are the old ones: rate of growth, and compressibility. Empyœma cum dilatatione is a very frequent source of ocular complications, and the most common one is naturally a dislocation of the globe. As, however, the majority of the closed exudations in the antrum are sterile, it is mostly the mucocele which we meet with, and this condition can give rise to an enormous displacement of the globe without much damage to vision. In the empyœma cases to the mechanical changes are added toxic ones, although sterility of the antral cavity does not exclude secondary changes in the tissues around of a septic nature.

The complications of osteomyelitis, pneumatocœle, and cholesteatoma are of little interest to ophthalmologists.

Gerber quotes 20 cases of antritis frontalis dilatans in which the bone was affected. It appears that the rhinologists did not recognise that the bone was so often affected, although the ophthalmologists have freely stated such to be the case. In 50 per cent. of the cases with bone affection there were eye symptoms. Hertzfeld quotes a case in which the necrosis was so great that the globe lay free in the antrum. The prognosis with respect to the eye is naturally worse in those cases in which the bone is affected. In empyœma cum dilatatione, oculo-orbital complications occur in 24 out of 38 cases, and in mucocele in 138 out of 178.

Gerber fully considers the anatomical relation of the antrum as a cause of these complications, and basing his conclusions on statistics of 549 cases of eye complications in frontal antritis, he gives a very valuable *résumé* of the whole subject. There is so much which is of value to the ophthalmologist in

this portion of the book, that the reviewer has made an abridged translation of it.

The *oculo-orbital complications* can be grouped into three classes:— (i) those of the orbital tissues; (ii) those of the adnexæ; (iii) those of the globe itself. There are also three methods by which these complications may arise:— (a) by pressure, (b) by infection, (c) by functional disturbance. In about 20% of the cases of frontal antritis, some ocular complication may be expected.

The *mechanical factor* (a) is most obvious in cases of antritis dilatans; displacement of the globe occurred 108 times in 178 cases of mucocele, i.e., 60% and 21 times in 38 cases of empyema (i.e., 55%).

The mechanical factor (a) may complicate an infective spread, (b) thus an encapsulated orbital abscess due to the spread of infection may press on the orbital contents.

An *infection* (b) can occur either by direct spread through the wall, or by way of the vessels. A periostitis leads by contact to orbital suppuration; or indirectly by thrombophlebitis the inflammation may reach the orbit or globe.

Functional disturbances (c) without anatomical change, consist in diminution of the field or the visual acuity, and muscular or accommodative asthenopia.

German's classification is somewhat similar to this.

i. Complications arising in the Orbital Tissues.

The first symptom of such an occurrence is often only a slight *swelling* of the *upper lid*, with narrowing of the fissure. Then is added *tenderness* on *pressure* on the orbital margin and the lids themselves. A *persistent edema* is important. At this stage there is probably only a periostitis, and a slight cellulitis. Repeated attacks cause thickening of the periosteum, and a collection of pus under it. The edema may be followed by *redness* of the whole upper lid, and *chemosis* of the conjunctiva, with a *fluctuating swelling* in the upper and inner angle of the orbit. This *orbital abscess* may be acute with all the signs of a severe *orbital cellulitis*, causing *panophthalmitis* or even death. It more often is chronic with very little orbital reaction; the *globe* is *displaced*, *diptopia*, *strabismus*, and *epiphora* resulting from pressure. On deep palpation of the tumour, the opening into the antrum may be felt, but in many cases the connecting channels are very small. Such an orbital abscess may remain after the antritis has completely resolved.

Important diagnostic signs are:—Discharge of pus from the nose on pressure on the abscess, or through a fistula on sneezing; the passage of a sound showing an empyema, transillumination, X-ray examination, or an exploratory incision into the antrum.

(ii) Complications arising in the Adnexæ.

These are due to pressure or infection. In the *lids*: edema, cellulitis, abscess or fistula formation, blepharitis, ptosis, ectropion, and cicatricial contraction. *Lacrimal affections* are rarer than when the maxillary antrum is affected. Epiphora and dacryocystitis have been observed, and cysts have often been misdiagnosed as dacryocystitis or tumours. The *muscles* most often affected are the levator and superior rectus.

(iii) Complications affecting the Globe.

These may be caused by pressure, or by an infection of its interior. Dislocation will generally cause optic atrophy, partial or complete, according to the rapidity of displacement. The cornea suffers from exposure. Uveitis is frequent, and generally depends on the retention of the pus in the antrum. Such conditions are not peculiar to the frontal sinus. Detachment of the retina may occur; but the commonest sign is in the optic nerve: hyperæmia,

neuritis, or retrobulbar neuritis. Thrombosis of the central vein or of the cavernous sinus has occurred.

(iv) **Functional disturbances.**

Commonest are flickering scotomata, migraine, constriction of the field, and muscular trouble. Kuhnt describes three types of field contractions :

1. Considerable contraction for white, very little for colour.
2. Concentric contraction for all.
3. White normal, colours constricted.

Enlargement of the field and central scotoma have been recorded.

(v) A great variety of changes in the eye have been recorded in cases of antritis frontalis, in cases where there was no demonstrable connection between the eye affection and the sinus.

The frequency and nature of the cranial complications of frontal antritis are fully discussed with an elaborate analysis of recorded cases. Gerber concludes with a critical account of the treatment of frontal antritis.

The book is a very valuable record ; and if the purely rhinological portions are as valuable as are the ophthalmological, Dr. Gerber can be cordially congratulated on his work.

ANGUS MACNAB.

NOTES AND ECHOES.

Deaths.

EDWIN S. HITCHINS, a well-known ophthalmic surgeon of Spokane, Washington, died on October 28th, last. We have also to announce the deaths of George H. Bicknell, adjunct professor of ophthalmology in the University of Nebraska, at the early age of 44 years, and of J. W. Jewett, of New Haven, at the age of 54 years.

Henry E. Clark, C.M.G., of Glasgow, has recently died from pneumonia. In his earlier days he filled the post of assistant surgeon and surgeon to the Glasgow Eye Infirmary, but he relinquished eye work on his appointment as surgeon to the Glasgow Royal Infirmary. At one time Clark edited the *Glasgow Medical Journal*. He had been President of the Faculty of Physicians and Surgeons of Glasgow, and had occupied the presidential chairs of three of the local medical societies. His decoration was bestowed upon him for his services at the time of the Boer War, when he was in charge of the Scottish National Red Cross Hospital at Kroonstad.

* * * *

Honours and Appointments.

THE King has been pleased to appoint George Andreas Berry to be honorary surgeon-oculist to his Majesty in Scotland, in the place of the late Argyll Robertson.

Speaking of Argyll Robertson, readers may be interested to learn that his body was cremated on the banks of the river Gondli, in accordance with his expressed desire. According to all accounts, the ceremony was most impressive. The service was read by the Reverend G. S. Stevenson, himself an Edinburgh graduate and a Fellow of the Royal College of Physicians of Edinburgh. The pyre was lit by his host, the Thakur Sahib, who, in doing so, broke the traditions of his ancient race, since it is contrary to all usage for a Hindoo Rajah to wear mourning or to take any part in a funeral procession.

Etienne Rollet, professor of ophthalmology in the University of Lyons, France, has been nominated *Chevalier de la Légion d'Honneur*. Dr. C. J. M. Abadie, of Paris, has been elected a foreign corresponding member of the Royal Academy of Medicine of Belgium.

Mr. Herbert C. Mooney, assistant surgeon to the Royal Victoria Eye and Ear Hospital, has been appointed assistant surgeon to the ophthalmic department of St. Vincent's Hospital, Dublin. Dr. W. B. Inglis Pollock, formerly pathologist and bacteriologist, has been appointed clinical assistant, and M. Logan Taylor, pathologist and bacteriologist to the Eye Infirmary, Glasgow.

Privatdozent Dr. S. Eperon has been appointed extraordinary professor of ophthalmology in Lausanne. Professor Uhthoff has been appointed an honorary member of the Moscow Ophthalmological Society. Professor Th. Axenfeld has been nominated *Geheimer Hofrat*, in connection with his refusal of a call to Vienna in succession to the late Professor Schnabel.

* * *

The late Dr. Beevor. The late Dr. Charles Edward Beevor, one time Vice-President of the Ophthalmological Society, whose death was announced in the January number of *THE OPHTHALMOSCOPE*, left estate of the gross value of £41,439 16s. 2d., of which the net personality has been sworn at £41,037 10s. 1d.

* * *

French Committee on the Blind. THE French Minister of the Interior has nominated a permanent Committee for the Assistance of the Blind. Amongst its other members the Committee includes a medical man belonging to the *Quinze-Vingts*, and two belonging to the *Syndicat général des Oculistes français*, all to be elected by their colleagues. The Committee will report on three main points:—(1) the prevention of blindness in France; (2) the effect of the law of July, 14th, 1905, dealing with the obligatory assistance of the indigent blind; and (3) the possibilities of rendering help by means of workshops for the blind.

* * *

At the meeting of the Ophthalmological Society, held on **Colour Vision Theories.** January 28th, Mr. A. S. Percival, of Newcastle-upon-Tyne, read a communication on "Colour phenomena due to intermittent stimulation with light, and a note on Benham's top." After referring to the work done by Mr. G. N. Stewart on Talbot's Law, and giving Mr. Stewart's diagram of the curves of the rise of stimulation of the three primary colour sensations, he proceeded to show that the phenomena of Benham's top were readily explained in the same way, when irradiation was also taken into account. After the eye had rested by observing the black half of the disc, it was suddenly stimulated by white light. On referring to the diagram it was seen that the red sensation at first rose most abruptly, and that, therefore, on a rise of stimulation a red colour was seen initially. With a fall of stimulation, again, it was obvious that a blue colour must be seen, as occurred when the eye had been observing the white part of the disc, and then suddenly encountered the white arc. In this way the different colours seen on rotating the disc clockwise and counter-clockwise were completely explained. Mr. Percival pointed out that the explanation rested entirely on the Young-Helmholtz theory of colour-vision, and he asked for an explanation according to the newer theory. It is somewhat unfortunate that no reply was forthcoming when the President called upon the supporters of the new theory of colour-vision for their criticisms and explanations.

* * *

The Vienna Chair of Ophthalmology. THE professorship of ophthalmology at Vienna, rendered vacant by the death of J. Schnabel, which took place on the 4th of last December, has not yet been filled up. Three well-known ophthalmic surgeons have, however, been selected, and

the eventual appointment will vest in one or other of them. The names are those of Uhthoff (Breslau), Hess (Würzburg), and Dimmer (Graz).

* * * *

Ophthalmological Society.

READERS may be reminded that a special meeting of the Ophthalmological Society will be held on March 12th, "to consider the question of amalgamation of the Ophthalmological Society of the United Kingdom with the Royal Society of Medicine." The memorandum recently issued by the Council shows clearly which way official opinion is veering. The result, however, will be largely determined by the attendance of the extra-metropolitan members of the Society, who form more than 70 per cent. of the constituency. On the whole, amalgamation is more likely to be palatable to the London than to the other members of the Society. *Verb. sap.*

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Belgian Ophthalmological Society.

THE Belgian Ophthalmological Society at its meeting in November, 1909, will discuss the treatment of accidents to the eye caused by electricity. The discussion will be opened by Dr. van Lint.

* * * *

The Centenary of Braille.

LOUIS BRAILLE, the inventor of the raised characters for the blind that go by his name, was born on January 9th, 1809, at Coupvray, near Meaux, in the French department of Seine and Marne. When a child of three years, Braille tried to help his father, a saddler, and in cutting a strap, injured one of his eyes irretrievably. The other eye was lost from sympathetic disease. The child, thus blinded, was admitted to the *Institution Nationale des Jeunes Aveugles* at Paris, where he soon distinguished himself by his earnestness, and was later appointed one of the professors. While acting in this capacity, Braille invented the famous raised characters now employed by the blind in every part of the civilized world. They represented a considerable advance over the method then in use, which had been invented by an officer of artillery named Barbier. Louis Braille died from lung trouble in the year 1852.—*Wochenschrift für Therapie und Hygiene des Auges*, 1909, No. 20.

* * * *

XI. International Congress of Ophthalmology, Naples, 2nd to 7th April, 1909

WE are asked to intimate that an effort is being made to arrange special terms for travelling expenses and hotel accommodation for the benefit of those who may wish to attend the above Congress. We may also remind our colleagues that it is proposed to print, for perusal before the meeting, the communications which are offered for discussion at Naples. These will be sent only to those who have signified their intention to be present, and have paid the subscription in advance (25 francs for members and 10 francs for each accompanying member of a family). To facilitate these arrangements, it is desirable that those who wish to attend should make the earliest possible intimation to one of the corresponding members for Great Britain and Ireland: Mr. Walter H. Jessop, 73, Harley Street, London, W.; Dr. George Mackay, 20, Drumsheugh Gardens, Edinburgh; or Sir Henry Swanzy, 23, Merrion Square, Dublin.

* * * *

International Prize Competition.

As readers probably know, the Hungarian Minister of the Interior offered a prize of 1,000 crowns (£50) for the best work on the aetiology of trachoma. The conditions required were original matter and important facts on the progress of the disease. The competition-term ended on December 31st, 1908. We understand that seven works have been sent in, viz.: three from Germany, two from Russia, one from Bulgaria, one from Egypt. England is conspicuous, as usual, by its absence! The Minister of the Interior, Count Andrassy, has named as judges the following University Professors: Kolle (Bern), Pfeiffer (Königsberg in Pr.) and Emil Grösz (Budapest). The decision of the judges will be announced during the XVth. International Congress, to be held at Budapest in September next.

* * * *

XVth International Medical Congress.

Preparations for the International Medical Congress, which will be held at Budapest from 29th August till 4th September, 1909, are so far advanced that the second Circular with current sketches, names of all members and their chosen lectures, will shortly appear. A lively interest is shown by our colleagues in the ophthalmological (IX) Section of the Congress; in spite of the XIth International Ophthalmological Congress, which will be held this year in Naples. A large number of reports and communications have already been announced. The reports will be classed in such a manner that doubtless a day will be reserved for those dealing with cataract-operations, post-operative inflammations, and questions concerning trachoma, serotherapy, and treatment of glaucoma and of squint.

Manuscripts should be forwarded at once, so that they may appear on the 1st July, in order to be sent to the Members of the Section on the same date. The length of reports must not exceed a printer's sheet of sixteen pages in octavo. Those papers received later than 28th February can be printed only after the Congress. The latest date for announcing subjects chosen for communications is the 30th April. Dr. Emile de Grösz, of Budapest, is President of the Section on Ophthalmology. During their stay in Budapest, members, without doubt, will be interested in the new Clinical Eye Hospitals of the Imperial Hungarian University. Hospital I was opened last September, and the second will be opened during the Congress. In addition to the private and royal hospitals of great interest to the members will be the wards opened by the State for the treatment of trachoma patients, containing 112 beds, and affording rich material for observation and studying the disease.

* * * *

London Ophthalmic Exhibition.

It is announced that an Ophthalmic Exhibition (the first held in Great Britain) will take place on March 12th and 13th next, at 11, Chandos Street, Cavendish Square, London, W. The idea, apparently, is to bring together for the inspection of medical men the latest optical and ophthalmological appliances, together with instruments, books, and other things likely to interest ophthalmic surgeons. Tickets for admission, free, can be obtained on application to Mr. E. Schofield, 11, Chandos Street, W.

* * * *

Ourselves.

AMONGST the congratulations received upon the increased size and the bettered appearance of THE OPHTHALMOSCOPE, none has given us more genuine pleasure than the *native* appreciation of the junior house-surgeon to a large and important ophthalmic institution in the North. "The Ophthalmoscope," remarked this youth, "wasn't bad, and contained quite a number of interesting odds and ends." Praise from Lucullus is praise indeed!

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ORIGINAL COMMUNICATIONS.

LABYRINTHINE NYSTAGMUS,

BY

ARTHUR W. ORMOND, F.R.C.S.,

OPHTHALMIC SURGEON, GUY'S HOSPITAL, LONDON.

A considerable amount of work has been done lately on lines indicated originally by Breuer and more recently worked out by Bárány on the subject of nystagmus. A paper recently read before the Otological Section of the Royal Society of Medicine by Mr. Sydney Scott* carries us still further in the same direction, and will be read with interest by all ophthalmic surgeons. Labyrinthine nystagmus, *i.e.*, the nystagmus produced by stimulation of the labyrinth, may be of three main types, namely, horizontal, vertical, and rotatory; the movement consists of a slow, followed by a rapid, oscillation; it is most intense when the visual axes are directed towards a certain point on the limits of the binocular field of vision.

Mr. Scott tabulates the results of his research upon the movements of the eyes produced by thermal and rotation stimuli, *i.e.*, by irrigating the ear with hot (110—118 F.) and cold (80—65 F.) water and by rotating the patient on a revolving table.

TABLE I.—Rotatory (counter-clockwise) nystagmus observable during attentive deviation and fixation of the eyes to the right.

By thermal methods.

Cold water irrigation	Left ear	Head erect
Hot " "	Right " "	" "
" " "	Left " "	" inverted
Cold " "	Right " "	" "

By rotation around a vertical axis.

Rotation counter-clockwise	Face directed downwards
" clockwise	" " upwards

TABLE II.—Rotatory (clockwise) nystagmus observable during attentive deviation and fixation of the eyes to the left.

By thermal methods.

Cold water irrigation	Right ear	Head erect
Hot " "	Left " "	" "
" " "	Right " "	" inverted
Cold " "	Left " "	" "

By rotation around a vertical axis.

Rotation clockwise	Face directed downwards
" counter-clockwise	" " upwards

TABLE III.—Horizontal nystagmus observable during attentive deviation and fixation of the eyes to the right.

By thermal methods.

Cold water irrigation	Right ear	Face downwards
Hot " "	Left " "	" "
" " "	Right " "	" upwards
Cold " "	Left " "	" "

By rotation around a vertical axis.

Rotation counter-clockwise	Head erect
" clockwise	" inverted

* "The Problem of Vertigo: Some new data obtained in a research into the functions of the semicircular canals in relation to movements of the eyeball in the human subject," by Sydney Scott, M.S. Read before the Otological Section of the Royal Society of Medicine, March 6th, 1909.

TABLE IV.—Horizontal nystagmus observable during attentive deviation and fixation of the eyes to the left

By thermal methods.		
Cold	water irrigation	Left ear Face downwards
Hot	" "	Right " " "
"	" "	Left " " upwards
Cold	" "	Right " " "
By rotation around a vertical axis.		
Rotation clockwise		Head erect
" counter-clockwise		" inverted.

TABLE V.—Vertical nystagmus observable during attentive deviation and fixation of the eyes upwards (in relation to the orbit).

By rotation methods.	
Rotation counter-clockwise	Right side of head downwards
" clockwise	Left " " "

TABLE VI.—Vertical nystagmus observable during attentive deviation and fixation of the eyes downwards.

Rotation clockwise	Right side of head downwards
" counter-clockwise	Left " " "

Mr. Scott thus claims to be able to produce experimentally any of the commoner varieties of labyrinthine nystagmus, and the conditions laid down by him with regard to the ear syringed, the temperature of the fluid, the position of the face, and the attentive deviation and fixation of the eyes being known, it is possible to predict the kind of nystagmus which will result.

The cause of the nystagmus has been suggested by Mach and Breuer, and is, that a movement of the endolymph in one or more of the semi-circular canals is brought about by convection currents, and these acting on the fibrille of the epithelial cells of the ampullary crests, cause a displacement of the cupula of the crista, the result of which is an impulse along the vestibular nerve. Mr. Scott epitomises the inferences which he draws from a study of these data in the following words, "the inferences which I have drawn from a study of these data have led me to regard the ampullary apparatus as the receptive organ of stimuli set up by deflection of the fibrille; that under ordinary conditions the deflection is produced by movements of the head; that the force causing the deflection is due to inertia of the fine ends of the fibrille; that the impulses are conveyed by the ampullary nerves to the brain; that these afferent impulses affect among other parts the ocular-motor apparatus and cause a movement of the eyeball; that this movement of the eyeball aids attentive fixation of the visual axes upon an object during movements of the head; that the direction of movement of the eye-ball depends upon the source of the stimulus; when the stimulus originates in the ampulla of the external semi-circular canal, the direction of ocular movement is horizontal; when the stimulus arises in the ampulla of the superior canal, the movement of the eyeball is rotatory; and when the stimulus originates in the inferior ampulla of the posterior semi-circular canal, the movement of the eyeball is vertical."

"Moreover, when stimuli arise simultaneously in the external and superior semi-circular ampullae the resultant eye-movement is composed of horizontal and rotatory elements; that when the stimuli originate simultaneously in the superior and inferior ampullae, the resultant movement is composed of rotatory and vertical elements; and that when the stimuli arise simultaneously in the external and inferior ampullae the resultant eye-movement is oblique. And similarly when stimuli originate in all three canals simultaneously the resultant eye-movement is composed of horizontal, vertical and rotatory

elements. The direction of eye-movement in any particular plane depends upon the direction of deflection of the fibrillæ in the ampulla in which the stimulus originates. The rapidity and extent of movement of the eye-ball varies directly with the intensity and duration of the stimulus. The intensity and duration of the stimulus will vary directly with the rapidity and period of movement of the head."

With regard to the functions of the normal labyrinth, he points out that the eyes are enabled to follow a rapidly moving object, held at a distance of 18 inches from the eyes, in a perfectly smooth and regular manner so long as the head can be moved at the same time as the eyes; but, on the other hand, if the head is kept erect and motionless, the movements of the eyes on following an object held at 18 inches from the face become jerky as soon as the movement is at all rapid, and consequently the suggestion is that the labyrinthine reflexes aid us in obtaining a perfectly smooth and even ocular movement. It has been suggested before that the more rapid of the two movements of which the labyrinthine nystagmic wave consists is the secondary and not the primary; the primary movement, our author says, is an exaggeration of the normal reflex movement of labyrinthine control, and is the slower movement of the two, the rapid movement being due to a reflex action of "attentive pursuit"; the result of the slow movement is to produce a succession of fleeting images sweeping across the retina, and the eyes are rapidly jerked in pursuit of the apparently moving object.

One might, however, point out that the rapidity of the movement precludes vision, and that the rapid phase is a blind one; moreover, it has been shown by Professor Dodge (*vide Annals of Ophthalmology*), that the ocular reaction time is much too slow to allow the visual impression to be the cause of such a rapid reaction, and that, therefore, we must look elsewhere for the causation of this rapid movement rather than attribute it to the reaction from visual impression.

The conclusion of Mr. Scott's paper deals with the spontaneous nystagmus which follows complete destruction of the labyrinth on one side; he thinks that it is best explained by referring the phenomenon to the result of impaction waves set up by carotid pulsation.

All this work which has recently been done on the subject of nystagmus suggests that possibly we ought to look upon abnormalities of, or disease in, the labyrinth as being the reflex cause of many of the cases of nystagmus which come before us. So little success has attended all efforts to explain satisfactorily the existence of nystagmus, that one is grateful for any assistance; the absence in many cases of all defects in the eye itself, and in others the presence of only slight lowering of the visual acuity and of refractive errors, suggest that in some cases the amblyopia is the result of the nystagmus rather than the reverse. How frequently one has noticed an improvement in the visual acuity with the lessening of the ocular movements and *vice versa*! Of course, it is not suggested that all cases of nystagmus are to be taken as labyrinthine in origin, but only that some forms hitherto unassociated with labyrinthine stimulation strongly resemble those usually classed as such.

In this connection let us consider the symptoms of spasmus nutans; the marked characteristics of the nystagmus in these cases is its unilateral preponderance, its onset without apparent cause in children a few months old, and the absence of any ocular lesion; the movement may be vertical, horizontal, or rotatory; the nystagmus may precede the head shaking or the head movements may be alone present. We must remember in regard to this

that the nystagmus may be so fine as to be only observable on ophthalmoscopic examination; two cases of this description have recently come under my notice where the nystagmus was quite invisible to naked eye examination. It would be interesting to know in the cases where the head nodding and the nystagmus are both present whether the movements of the head coincide with the examples tabulated by Mr. Scott.

Nystagmus is frequently found in Mongols; the defective development in the temporo-sphenoidal region suggests again that the vestibular nerve may be at fault.

With regard to occupational nystagmus, it is difficult to exclude the influence of currents set up in the semi-circular canal by the exigencies of the occupation—as, for instance amongst miners, where the swinging of the pick necessitates movements of the whole of the upper part of the body.

The frequency with which we find rhythmic movements of the head, arms, lids, or other parts in cases of congenital nystagmus is well known. May not some of these cases be associated with labyrinthine trouble?

True nystagmus occurs in 12 per cent. of the cases of multiple sclerosis, and lesions have been mainly found in the corpora quadrigemina, corpus striatum, restiform body, and the medulla.

I would therefore suggest in all cases where the nystagmus present exhibits more or less the characteristics of labyrinthine nystagmus that the examination of the ears should not be neglected; it may be assumed that if no alteration in an existing nystagmus occurs on stimulating the vestibular apparatus that there is an absence of function; on the other hand, when there is unilateral stimulation the spontaneous nystagmus will show a weakening or strengthening according to the position of the eyes.

In conclusion, Mr. Scott is to be congratulated upon the completeness of his research, the main facts of which will probably be tested by those attempting to obtain clinical aid for diagnostic purposes.

VOLUMINOUS SARCOMA OF THE BULBO-PALPEBRAL CONJUNCTIVA.*

By J. N. ROY, M.D.

OPHTHALMOLOGIST TO THE HÔTEL DIEU, MONTREAL, CANADA.

THE following observation seems to have a certain interest if we examine, either separately or collectively, the symptoms noticed in our little patient. Primary sarcoma of the bulbo-palpebral conjunctiva is indeed a comparatively rare affection in which the seriousness of the prognosis increases with the advance of the growth towards the orbit. Having for its origin the conjunctival chorion, or the adjacent connective tissue, the tumour in growing raises the oculo-palpebral mucous membrane which is stretched over it. In this case, the rapidity of the evolution of this unpigmented sarcoma, which in the short space of seven weeks developed in a child six years of age, should especially attract our attention. Although neither the preauricular nor the cervical glands were enlarged, we nevertheless considered the condition as very serious, since the tumour had already begun to spread to the orbital

* Read before the IVth Congress of the *Association des Médecins de Langue Française de l'Amérique du Nord*, Québec, July, 1908.

vault and the capsule of Tenon, and as a previous microscopic examination of the growth had shown its sarcomatous nature, we did not hesitate to sacrifice the still healthy eye in exenterating the orbit.

Case Report.

The child, T. R—, aged 6 years, was brought to the Hôtel Dieu Montreal, on January 11th, 1908, suffering from a tumour of the right eye. According to his mother, the tumour showed itself a month previous, at which time she noticed that this eye was smaller than the other. The ptosis, having one day attracted her attention more particularly, she attempted to open the child's eye wider, and found that there was "a kind of reddish skin" between the eyeball and the upper eyelid. No other symptom had previously been noticed, and this tumour, which had a tendency toward hæmorrhage, began from that time to secrete a sero-purulent liquid, which increased in proportion to the rapidity of its development.

Family History.—The little patient was one of nine children, one of whom had died at the age of three years of tuberculous meningitis. The others were in good health. We found, then, a certain tuberculous diathesis, but no trace of cancer.

Personal History.—The patient had a good constitution, was rather robust for his age, and had had no illness except a suppurating sebaceous cyst on the right side of the neck, which had persisted intermittently for five years. However, the mother admitted that his respiration was not normal, that at night he slept with his mouth open, and that his breathing was noisy.

There was no record of traumatism, or of foreign bodies in the right eye, nor even of conjunctivitis.

Present Condition.—On examination, we observed a tumour hanging on the cheek by means of a large pedicle inserted at the bottom of the superior cul-de-sac of the right eye. This neoplasm was of granular appearance, bled at the slightest touch, and was of an angry-red colour. It was partly covered by the ocular conjunctiva (much distended and ulcerated) and partly by the conjunctiva of the everted upper eyelid. A sero-purulent discharge escaped continually from this eye, causing a slight redness of the cheek. The tumour measured in its antero-posterior diameter about two centimeters; it was five centimeters in length, and seven centimeters in width. On lifting it, one observed that the cornea was normal, and that the pupil reacted well. The ocular tension was not increased; there was no exophthalmos, nor any depression of the eyeball. The movements of the eye were naturally limited, but the direct vision was as good in the right as in the left. No pain since the beginning of the illness. Absolutely normal condition of the left eye.

Anterior rhinoscopy of the two sides showed nothing very interesting, but posterior rhinoscopy allowed us to observe adenoid growths. Slight hypertrophy of the tonsils. The ears had never been diseased. There was no hypertrophy of the cervical or preauricular glands. No symptoms of hereditary syphilis or of tubercle.

Pathological Examination. A small piece of the neoplasm was removed for microscopic examination and entrusted to Dr. St. Jacques, who was good enough to send the following report:—

The microscopic examination of the preparations shows a mass of cells arranged without order. Here and there, *ashes* of the connective fibres are observed. One of the preparations shows a tendency towards alveolar arrangement. The cells are small and round, the nuclei rather large, very

VOLUMINOUS SARCOMA OF THE BULBO-PALPEBRAL
CONJUNCTIVA.

BY

J. N. ROY, M.D.

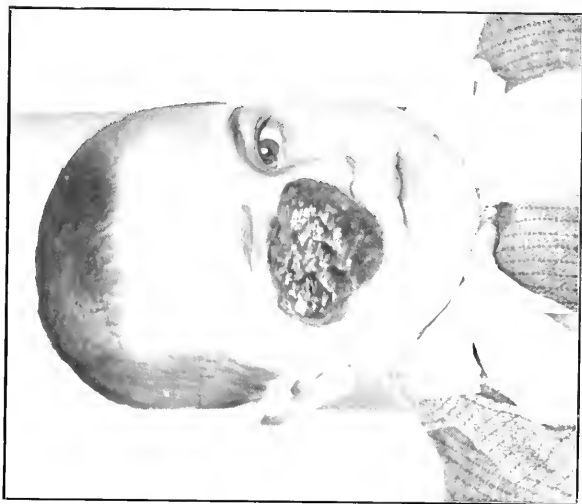


Fig. 2. [Box 20] 1008

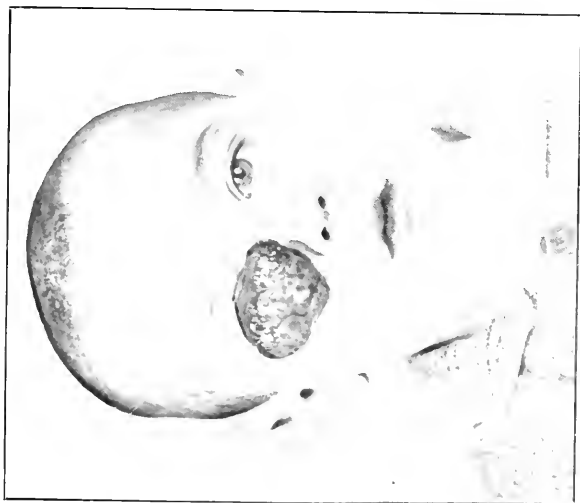


Fig. 3. [Box 20] 1008



variable in size, and presenting numerous karyokinetic figures. In the field there appeared a large number of vascular formations, very characteristic of sarcoma, among others, openings whose walls were formed by the cells of the growth itself. The greater part contained no blood corpuscles. There was no epithelial covering visible on the surface of the tumour. Near the periphery are found capillaries containing red corpuscles. These capillaries are seen sometimes in transverse, sometimes in longitudinal section. Some, however, contained comparatively large numbers of white corpuscles, which is easily understood seeing that from the surface of this tumour exuded a rather abundant muco-pus. There is a slight inflammatory infiltration. These preparations contained no pigment.

Diagnosis: Round-celled sarcoma of apparently rapid growth.

Treatment.

As the microscope had shown the malignant nature of the tumour, we proposed to the family to undertake immediate removal, and the operation took place on the 28th of January.

First Operation.—The patient having been anaesthetised with chloroform, and the field of operation rendered aseptic, we first made a large canthotomy. Having raised the growth, we were able to incise the ocular conjunctiva which was separated from the upper two-thirds. We then observed that Tenon's capsule had been invaded and raised from the underlying sclerotic, now plainly visible. The pedicle was implanted the whole length of the superior cul-de-sac, and imbedded in the orbit for a depth of one and one-half centimeters. The everted eyelid did not, however, adhere to the tumour, which was easily separated from the healthy tissue and removed. It was found to weigh fifty grammes. This marked destruction of the capsule of Tenon and of the roof of the orbit, left no doubt as to the gravity of the condition, and obliged us to continue the operation by proceeding to a complete exenteration of the orbit. We then sacrificed this eye, which was normal internally, as well as the retro-bulbar tissues. Great care was taken in the cleaning of the orbit. All doubtful tissue was removed from the eyelids and the operation completed by a careful cleansing of the wound, some sutures at the external canthus, and an appropriate dressing. We also took advantage of the anaesthesia to curette the suppurating sebaceous cyst, to which we applied tincture of iodine.

The bacteriological examination of this pus revealed nothing particularly interesting except absence of tubercle bacilli and actinomyces.

Progress.

The post-operative care was most simple. The cavity, washed daily with hydrogen peroxide, suppurated very little, and became rapidly covered with a layer of healthy granulation tissue; everything that showed a tendency to hæmorrhage was cauterised or removed by curetting. At the end of a month, the little patient was considered nearly cured, and we proposed to perform the following week a median tarsorrhaphy when serious complications occurred to prevent this. Scarlatina and varicella were conveyed to him simultaneously by his relations, who came to visit him at the Hôtel-Dieu, and we were obliged to send him to the St. Paul's Hospital for Contagious Diseases, where he was admitted February 28th. March 5th, being in full eruption with scarlatina, varicella was noticed and spread from him to all the other little patients in that ward. From this time this combination of diseases caused a very serious illness, and on March 13th acute nephritis came on. Two days after endocarditis was diagnosed, and on March 20th generalised œdema appeared.

To complete this series of striking symptoms, on March 26th there came on a general cedematous infection of the scalp. In spite of all these complications, his temperature never exceeded 105°F., and the improvement was such during the month of April that the patient was allowed to

return to the Hôtel-Dieu on the 29th entirely recovered from his eruptive fevers. We then continued to treat the orbital cavity, which had become infected during his stay at the St. Paul's Hospital, removing from it the granulation tissue which had accumulated in the lower part only. These granulations, examined under the microscope revealed no trace of sarcoma, and reassured us as to the possibility of a relapse. At the end of a month's time, the wound in the orbit was healed, as was also that in the neck, which had been curetted and to which wet dressings had been applied.

The adenoids having been removed, only the æsthetic treatment of the orbital cavity remained. The upper eyelid being retracted, left the cavity slightly opened, which, aside from causing a disagreeable appearance, exposed the patient to infection from the outside.

As the orbit was partly filled with a solid granular tissue, we decided to perform a median tarsorrhaphy, which took place on June 4th.

Second Operation.—Again under chloroform, we detached the eyelids circularly even to the bony margin. After having trimmed the median part of the Meibonian lips for the length of a centimeter, we applied two sutures, preserving the normal position of the ciliary field. Hemostasis being complete, we finished this little intervention by applying a compressive dressing. During the days following we used antiseptic washes, and on the 18th of June, the patient returned home entirely cured.

We were pleased to observe that the palpebral opening was entirely closed, and in spite of the tarsorrhaphy, the orbicular muscle had retained a certain power of action. The orbital depression is but slightly noticeable, and the eyelids are applied directly to the bottom of the cavity.

Is the cure permanent? If we consider, on the one hand, the rapid development of the sarcoma before removal, and, on the other, the fact that the cure has already lasted for fourteen months, we have cause to hope so.

THE REMOTE RESULTS OF OCULAR MOTOR PALSIES*

BY

Dr. A. ANTONELLI,

PARIS.

THE study of the remote results of ocular motor palsies seems to me to yield several interesting considerations regarding the physio-pathological and clinical aspects of these affections.

We do not desire to discuss the patchy (*parcellaire*) and fleeting palsies of pretabes, which may disappear and leave no trace, nor yet the diseases known as progressive nuclear ophthalmoplegia and acute ophthalmoplegia (poliencéphalitis, chronic or hæmorrhagic) which have such a grave prognosis.

We are about to consider especially the ocular motor palsies of confirmed tabes, or at any rate of syphilis of the nervous system, when these palsies do not disappear or become only incompletely cured, and thus lend themselves to the study of persistent paralytic strabismus. The subacute ophthalmoplegias of diabetes, of infective or toxic conditions (diphtheria, pneumonia, scarlet fever, etc., alcohol, nicotin, lead) which are much rarer than syphilitic ophthalmoplegias, may have analogous remote results. What, then, are the characteristics and the factors of this paralytic strabismus?

* Communicated to the Congrès de Neurologie, août, 1907.

They must be considered from the standpoint of ocular statics and dynamics, or, in other words, as regards the *deviation* and the *defects of motility* of the affected eye.

It would be useless to discuss the manifestations of recent paralytic strabismus, which cannot be confused with a concomitant squint. But it is otherwise in certain cases of old paralytic strabismus in which the following is the sequence of events :

Let us take a palsy of the sixth pair, a complete paralysis of syphilitic origin for instance, such as we see so often in our own clinics. If the paralysis resists treatment, as so frequently happens, and so leaves certain functional defects, these defects are especially objective (diplopia and other subjective defects disappear after some weeks or months), and appear in the form of more or less obvious strabismic deviation of the affected eye, secondary deviation of the other eye, etc. Now this paralytic strabismus will present, as time goes on, more and more the character of a concomitant strabismus ; that is to say, the right eye will be deviated inwards when at rest ; it will accompany the left eye during an extensive movement of the left eye towards the right of the patient, while at the same time retaining the strabismic deviation ; it will perform the movement necessary for fixation when the left eye is screened, and when fixing alone it will follow the finger to complete abduction, or at least to a much greater abduction than in binocular associated movement. In other words, the paralysis, so complete at first as to render all abduction of the right eye impossible, has been transformed into a simple paresis, one portion of the abduction being regained ; this paresis will show itself especially in associated abduction (both eyes turned to the right) ; it becomes much less marked or even disappears during the use of the right eye alone, (complete abduction of this eye, integrity of its monocular field of fixation measured on the perimeter).

Palsies of the third pair do not lend themselves nearly so well as those of the sixth pair to the study of the remote results of paralytic strabismus, and of the analogies of the strabismus with the so-called concomitant strabismus. There are, nevertheless, some cases of paralysis of the common oculomotor which, reduced to simple defect of adduction, end by presenting exactly the characteristics of concomitant divergent strabismus. If we take, for example, an old paralysis of the left common oculomotor, imperfectly cured, with persistent divergent strabismus, and ask the patient with both eyes open to fix the finger at about 30 cm. and to follow it from his left to his right, we see that the two eyes follow the finger, the right eye fixing, and the left always retaining the same degree of divergent strabismus. If, when the finger has arrived almost opposite the left eye we cover the right eye with a screen, the left eye will be observed to make an immediate movement of re-adjustment so as to fix, and to follow the finger perfectly up to extreme adduction, up to the nasal limit of the field of fixation ; while the right eye, behind the screen, will show a slight secondary convergent deviation. There is no need to insist upon the similarity of these facts to those which are characteristic of so-called concomitant squint.

There may remain in these cases some secondary deviation of the sound eye which would bear witness to the paralytic origin of the strabismus. But it is a sign which becomes less marked, and disappears as time goes on, and from that time the strabismus will have all, and only, the characters of a divergent concomitant strabismus. The same thing happens in the case of the nystagmic oscillations which appear sometimes when monocular fixation with forced adduction and abduction of the squinting eye are demanded, while the other eye is covered. Naturally, the return of function is gradual, and the

paresis which follows the paralysis may be accompanied at first by nystagmic jerks; but this is transitory, and the paresis becomes less and less marked, till it no longer appears in individual movements of the affected eye, and only shows itself by concomitant strabismic deviation—that is to say, by a paresis of associated movement (adduction or abduction).

It must be remarked, with regard to the results of palsies of the common oculomotor, that the symptomatology is much more complex than that of palsies of the abducens, not only on account of the number of muscles and functions on the affected side which may be concerned, but also on account of the partially crossed action of the common oculomotor. It is well known, thanks especially to Bernheimer's researches, that the inferior rectus, to speak only of the extrinsic ocular musculature, receives crossed innervation, the inferior oblique an innervation in major part also crossed, the internal rectus both crossed and direct, the superior rectus mainly, and the levator palpebræ entirely, direct innervation. (It must be understood that we are speaking of the crossing of the peripheral neuron and not of the cortico-nuclear neuron.) In nuclear or trunk palsies, a unilateral lesion of the common oculomotor may thus give *crossed pareses*, to which, we think, sufficient attention has not up till the present been given by observers.

When the ptosis and the defect of elevation, which are the early and predominant signs of palsy of the third pair, have disappeared, there may remain a diplopia with characteristics which may prove disconcerting when examined by the aid of a red glass, inclination of the head, etc.

Crossed diplopia may persist, because adduction has been affected in both eyes (direct and crossed innervation of the internal recti), and it will appear especially when the fixation object is brought near, convergence being particularly impeded. But this crossed diplopia will be sometimes associated with a certain vertical diplopia or with a tilting of the images which would make one think of dissociated pareses or paralyses which are almost improbable. One must think, in such a case, of residual affections of motility in the eye on the sound side, especially in the actions of the inferior rectus and of the inferior oblique, the former receiving an innervation totally crossed, and the latter an innervation *mainly crossed*. These facts deserve further attention.

An old paralytic strabismus may then present, as we have said, all the characters of concomitant strabismus, or of certain forms of the latter; especially those in which the deviation constantly concerns one eye (non-alternating concomitant strabismus). Limitation of movement in an old-standing paralytic strabismus may exist only during binocular associated movements, just as is the case in concomitant strabismus.

Paresis of a muscle, when slight, may pass unnoticed during the measurement of the field of fixation of the affected eye alone, but always reveals itself when the binocular field is determined. This latter is always restricted in such a case, and this limitation of the binocular field of fixation towards the affected muscle is the expression of paresis of associated movements, unassociated movements remaining normal, or having become normal.

The analogies established by the remote results of paralytic strabismus between the latter and concomitant strabismus allow us to suppose that certain cases of concomitant strabismus may have their origin in an ocular motor paralysis or paresis in early life. This paralytic origin of strabismus can probably be invoked more especially in those cases of permanent unilateral convergent squint, which, while dating from the early years of life, present on the part of the deviated eye an acuity which is normal or very satisfactory,

enabling fixation and eye work to be sustained when the fellow eye is excluded.

The paralytic origin would also be probable for certain incoordinated squints of young subjects with a visual acuity which is fairly good and practically equal in the two eyes; one must in these cases, as in those of upward or downward strabismus, consider the possibility of complete or dissociate palsy of the third pair.

In strabismus **sursum-vertens** for instance, one not infrequently finds associated with the paralytic deviation, if one may call it so (defect of downward movement) of the squinting eye, a spasmodic deviation upwards of the other eye, accompanied by more or less distinct retraction of the upper lid when the squinting eye makes an effort at downward rotation. This phenomenon is frequent in old dissociated palsies of the common oculomotor in adults. Without desiring to generalise, one is, in short, driven to the conclusion that a certain number of concomitant squints might have as their original cause an oculomotor palsy. M. Morax very appropriately compares these facts with the difference which exists between the results of a hemiplegia or monoplegia occurring in early infancy, and the results of the same lesions in adults or old people. The paralytic origin of concomitant strabismus would give us, moreover, the cause of many of the clinical facts discovered in the aetiological study of strabismus; such as the frequency of this trouble in dystrophies due to congenital defect (hereditary syphilis more particularly (1)); its frequent appearance after infectious diseases or the convulsive or meningitic syndrome of infancy; and the frequency of convergent strabismus, corresponding to paralysis of the sixth pair, which latter is also the most frequently occurring of ocular palsies.

Another resemblance between concomitant squint and the remote results of paralytic strabismus is observed in **spasmodic deviation**. The latter shows itself, as is well known, by adduction of the fellow eye associated with adduction of the eye first affected, for example, in paralysis of the external rectus. A convergent strabismus, so to speak, binocular, very pronounced, and unequally divided between the two eyes is the result. Now it is not very unusual to see children with extreme convergent strabismus squinting with both eyes, there being an evident deviation of each globe in more or less forced adduction. Fixation is then alternate, at least when there is amblyopia or considerable ametropia of one eye. But if the hypermetropia in these young subjects is not very great, if there is no ophthalmoscopic lesion to account for the functional fixation trouble, it is needless to search elsewhere for the cause of the double deviation than in a paralytic deviation of the first eye, with perhaps spasmodic deviation (if not also paralytic) of the fellow eye.

Even as regards the secondary deviation, the paralytic strabismus tends in time to approach the condition of concomitant squint. In fact, in recent paralytic strabismus the secondary deviation (of the sound eye screened while the affected eye is made to fix) is more pronounced than the primary deviation (of the paralysed eye while the sound eye fixes); but, later on, the secondary deviation becomes less, and, after several months, if the paralysis is transformed into paresis, the secondary deviation becomes less pronounced than the primary, and minimal or absent if the affected eye has recovered its individual motility, though associated or binocular motility be absent.

As regards diplopia, also, there is a perfect analogy between the remote results of a paralytic strabismus and the characters of a so-called concomitant

(1) Antonelli. — *Archiv. d'Ophthalmologie*, octobre, 1898, and *Annales des Maladies Lénécriennes*, juillet, 1906.

strabismus. It is as easy to bring out diplopia by well-known means, the red glass and so on, in a case of paralysis with persistent strabismus, as in an ordinary young squinter. The older-standing the paralytic strabismus the less easy it will be to bring out the diplopia; and in the same way the treatment of concomitant squint by Javal's method is more difficult the greater the age of the subject, or the longer after the commencement of the strabismus the treatment is commenced.

Our aid is not often invoked, it is true, at a period frankly paralytic in squinting children; but one must consider that a number of squints commence suddenly after any illness of childhood (measles, whooping cough, &c.) and that, nevertheless, these children reach the oculist at the end of several weeks or even of several months. How, then, are we to establish the differential diagnosis and eliminate with certainty a paralytic etiology, since it is proved that the remote results of a paralytic strabismus may present absolutely the same functional characters as a squint which is called concomitant?

It is possible that the stage of paralytic strabismus which simulates concomitant squint ultimately allows of a perfect cure. I ought to say, perhaps, that the results which we are discussing have appeared to me to be characteristic of cases which after relatively rapid amelioration, spontaneous or aided by treatment, were destined to remain stationary; and of such cases I have seen and followed several for two years and more. What we are about to say in probable explanation of the facts will tell us the cause. But previous to the explanation it is necessary to speak of **secondary contracture**.

For the classical authors the remote results of paralytic strabismus were represented especially by *secondary contracture of the antagonist*, which would explain the persistence of the deviation even after the complete return of the function previously paralysed or paresed. This idea does not seem to us to be sound, and for the following reasons:—

It, in the ocular muscles, there happened what often happens in other muscles of the body in post-hemiplegic contractures or analogous pathological conditions, we ought to see, after a paralysis, for instance of the sixth pair, the eye deviating in abduction from athetosis of the external rectus. This never happens, probably because the anatomo-physiological conditions of the oculomotor nerves in their intra-cranial origins and connections are different from conditions of the cortico-spinal system (pyramidal bundle and spinal nerves). There is never, then, a *contracture*—at any rate manifest clinically—of a formerly paralysed eye muscle; the paralyses of eye muscles seem to be always and constantly *flaccid paralyses* (*paralyses flasques*). How much more reason is there for not admitting a **secondary contracture of the antagonist**. What would cause it? The antagonist is limited to preserving its tonus, which will cause the eye to deviate because the tonus of the affected muscle is abolished.

There is, then, no true contracture of the antagonist for there is no motor excitation of the internal rectus after paralysis of the external rectus, which explains the paralytic convergent strabismus. There is simply a change of equilibrium, the tonus of the external rectus being lost after the loss of contractility, and the tonus of the internal rectus remaining the only element in the ocular balance. In nerve pathology we know about contractures which precede or follow paralysis in a single muscle or in a certain group of muscles when the cause of the loss of nerve impulse is preceded or followed by an irritative factor. But there is no question of **contracture of the antagonists** in the monoplegias, and a palsy of the flexors is not accompanied by

contracture of the extensors, nor is a palsy of the orbicularis palpebrarum accompanied by contracture of the levator. Why then should the eye-muscles be an exception? Contracture in flexion of the upper limbs, for example, means an affection directly interesting the group of flexor muscles; it is never secondary to a palsy of the extensor group; in the same way we can conceive a convergent strabismus by contracture of the internal rectus (dissociated excitation of the third pair), but not a contracture, properly so-called, of this muscle, simply secondary to paralysis of the sixth pair.

Besides, the characteristic of contracture is to be persistent and involuntary. How then could it happen that in an old-standing paralytic strabismus which has taken on the characters of concomitant strabismus motility is found perfect when the sound eye is screened and the affected eye made to move? This would be absolutely incompatible with the theory of secondary contracture. The only admissible theory is that of *persistent hypotonus* of the *muscle formerly paralysed*, a hypotonus which disappears through the increase of central excitation as soon as attention comes into play, when we cover the fellow eye and demand monocular fixation by the affected eye.

What does exist, in general neuropathology, is the **shortening** of muscles by **adaptation** after complete and persistent paralysis of their antagonists; and we do not deny that after strabismus has lasted a very long time, whether it be paralytic or concomitant and whatever may be the cause, there may be an organic modification of the volume and length of the muscle homologous to the deviation. But still this is not a contracture in the proper sense of the term, and in order that organic muscular adaptation may be established, time, and a long time, is required. It is not, then, such an adaptation which brings about the periodic strabismic deviation of concomitant strabismus at its onset, nor yet the deviation in the early days of paralytic strabismus.

Strabismic deviation in ocular palsies is due generally, if not always, *to loss of tonus of the paralyzed muscle*. Muscular tonus, in paralysis of central origin, is in fact always diminished, **even at the period of contracture**, if contracture there be, for instance in hemiplegias. But this loss of tonus does not always come on very rapidly or completely; and that is why a palsy of the sixth pair for instance may remain for some time, as I have often noticed, without strabismic deviation—that is to say, it is characterized by pure and simple limitation of abductive ocular motility. It is only after several days or weeks that the eye begins to show a convergent strabismus, more and more marked as the tonic of the external rectus becomes feebler and feebler or totally lost, and that the internal rectus alone manifests its tonus and functional activity.

Contracture in the proper sense may by itself explain certain fleeting and varying diplopias of hybrid type (for instance, in certain cases of meningitis or in hysterical patients). But, just as dissociated palsies of the limbs rarely give place to contracture, in the true sense of the word (tonic contraction, persistent and involuntary) of the antagonists, it may be believed also that only rarely a true contracture of the internal rectus, for example, remains to exaggerate and render definitive the convergent strabismus due to a paralysis or paresis of the sixth pair.

If, after an ocular palsy, the motor function is established more or less rapidly, tonus also returns to the affected muscle, diplopia disappears, and the cure may be functionally perfect. But if the re-establishment of motility is delayed, the strabismus may persist all the same, with functional characteristics absolutely similar to those of concomitant squint, and that for the following reason:—

From the time when the strabismic deviation becomes added, even in the

resting position of the eyes (primary position, looking at a distance), to the essential affection of motility, diplopia becomes still more troublesome to the patient: his natural therapy, by neutralization of the image of the affected eye, comes rapidly into play. Neutralization having been acquired, it is then a case of permanent squint, for, even if eventually motility were re-established, the definite loss of binocular vision would have transformed the paralytic strabismus into a functional strabismus, having all the characters of a so-called concomitant squint.

We may sum the matter up in this way.—To know the remote results of ocular motor palsies will aid us in prognosis, and also in retrospective diagnosis, which may be of great importance in the history of a given case. Old-standing palsies of the sixth pair which have lasted a longer or shorter period (several weeks or months) leave a convergent strabismus, having all the characters of ordinary so-called concomitant squint, and that the more readily the younger the subject is. Old-standing palsies of the third pair, a little more rarely because their symptomatology is more complex, leave behind them a simple divergent strabismus, or at least a manifest insufficiency of convergence, absolutely analogous to the so-called concomitant divergence seen, for instance, in myopes. Isolated palsies of the fourth pair are too rare, at any rate among my own observations, to allow us to determine the remote results.

The remote results which we have been discussing with regard to the abducens and the common oculomotor concern, it must be understood, cases of cure of the affection of motility properly so-called. All the movements of the eye formerly affected have then become normal, and there only remain the **strabismic deviation** (affection of the static balance) and the **affection of associated motility** (dynamic affection of the binocular function).

The **deviation** is by no means due to a **secondary contracture**, which is proved by nothing, which everything points against, and which would find no support from known facts of general neuropathology (study of hemiplegias, etc.). Early appearing deviation is entirely due to **loss of tonicity of the paralysed muscle** and to the action of the **tonus of the antagonist**, which is the only remaining cause. At length, but only very much at length, this antagonist may show a **shortening by adaptation**, which does not, properly speaking, represent a **contracture**. The **deviation** provokes, from the time of its appearance, or aggravates at a later date, the diplopia; and then the neutralization of the false image comes into play. This neutralization comes to be the natural therapy of the diplopia, otherwise so troublesome. But later on, when the motor trouble is cured or reduced to a mere paresis of monocular abduction or adduction, it is this neutralization itself which is the persistent cause of suppression of the fixation reflex on the part of the deviated eye, and the cause of failure in the re-establishment of binocular motility properly so-called. The great ease with which the **neutralization** takes place in children explains the facility and the rapidity with which every paralysis or paresis of the ocular motor nerves terminates, more particularly in these patients, in the so-called concomitant strabismus.

ERNEST THOMSON.

THE OPTICAL PRINCIPLES OF THE KERATOMETER.

BY

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Although the one-position keratometer has been in practical use for nearly twelve months, up to the present moment no definite statement has been published of the special mechanism and optical construction of the instrument.

The term "ophthalmometer" properly means any instrument for measuring the eye, but custom, following the precedent of Helmholtz and continued by Javal, has applied it specially to instruments constructed to ascertain the corneal curves. This term, although erroneous, will, therefore, be used here to denote instruments requiring a rotation to the secondary position, while the term "keratometer," an acknowledged correct one, will be used for the one-position instrument to be presently described.

When one takes into consideration that ophthalmometric procedure has involved time for chin and head adjustment (always unpleasant to a patient), illumination troubles, the tedious and undefined attempts to secure an accurate focus, the uncertainty as to primary contact, the rotation to a secondary position, the efforts of remembering the question of overlapping or separation, combined with the restlessness of the patient, due to a prolonged examination, there is little wonder that retinoscopy often enjoys greater favour as a superior and cheaper method, especially with dilated pupils.

With all these difficulties, however, ophthalmometry has held its own as a valuable and corroborative test in refraction. It may, therefore, be reasonably assumed that if the time required for examination could be substantially shortened and the discomforts and uncertainties removed, then ophthalmometry, or, more properly speaking, keratometry, can be made into the most useful and time-saving test there is for the consulting room.

Without entering into corneal optics and the various telescope systems, a brief description of the elementary principles of ophthalmometry, as applied to the special form of mire of the Keratometer, will help to a better understanding.

The cornea may be considered as a convex mirror, having, for mathematical convenience, a curve of 45 dioptries, or 7.5 mm. radius. Any object reflected in it will appear very much smaller. If the object is circular and the mirror spherical at the points where the image appears, the image will be circular; if the mirror is of an egg shape, *i.e.*, longer in one diameter than another, the image will be oval instead of being round. The object of keratometry is to measure the difference between the length and breadth of this oval, as seen by an astigmatic patient. If the eye is truly spherical, the image is not oval; in such case the keratometer serves no useful purpose beyond proving the absence of astigmatism. It is a well-known optical fact that if we know the size of an object, its distance from the convex eye or mirror, and also the size of the image, then we know the curvature of the eye. Our aim is to ascertain the length and breadth of the image.

Why the Image is Multiplied in Ophthalmometry.

It has long ago been settled that the best way to measure the size of this image is to employ the principle of "doubling," based upon the old principle

of the heliometer. Suppose Fig. 1 to be the reduced circular image of a large circular object, as reflected in the eye of a patient. This is known as the "mire."

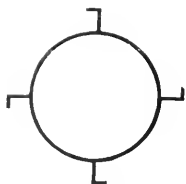


Fig. 1.

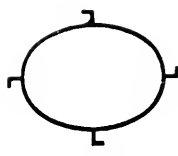


Fig. 2.

If the corneal curve is egg-shaped or astigmatic, say the length of the egg, which is supposed to be an equal-ended one, is in a horizontal position, the image will appear as in Fig. 2. Let us double it in a horizontal direction,



Fig. 3.

as in Fig. 3, so that the long ends are in contact. Now swing round the two ovals, still keeping the length of the oval at a horizontal axis, and we have Fig. 4, the ovals being separated. Imagine that by some method we can make the broad sides of the two ovals touch, as in Fig. 5, then we can

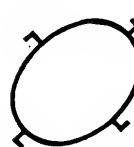
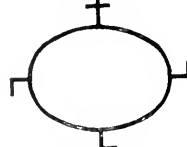
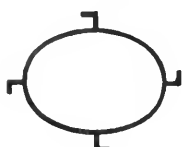
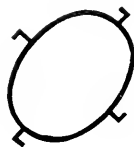
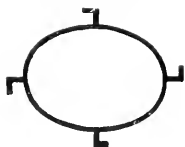


Fig. 4.

Fig. 5.

Fig. 6.

estimate the mechanical work required to do that as being the difference between the length and breadth of the oval. It might happen that the egg or oval might be lying in a diagonal position, in which case the images would appear as in Fig. 6, out of alignment. If we again swing them round, we shall have them as in Fig. 7, not in contact, but in alignment. We can make them approach each other. The

axis is thus found by alignment, the astigmatism by the mechanical amount of work performed by the instrument in approximation or separation. This gives a very rough idea of how the axis and the amount of astigmatism are found in the ordinary two-position instruments, although the keratometer mire pattern is here used for illustration.

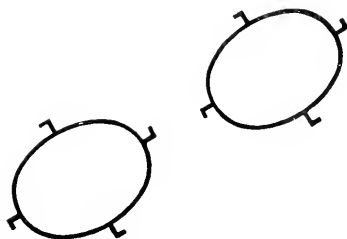


Fig. 7.

The keratometer consists of a trans-illuminated object (known as the mire), a doubling or "tripling" system, a method of approximation of the images and a new way of automatic calculation of the results. In order that the new principles of the keratometer may be clearly grasped, each part is described separately in comparison with the other forms of ophthalmometry.

The Keratometer Mire.

The keratometer mire (the English pronunciation with the long i is to be preferred) is a circle at four points of which are L-shaped hooks as in Fig. 1. This particular shape, curiously enough, was suggested by the old Indian lucky charm against the evil eye, known as the "Swastika." It is situated at about 125 mm. from the eye of the patient, is about 100 mm. in diameter, and forms an image slightly less than 3 mm. on a cornea of 45 dioptres. The

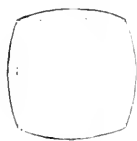


Fig. 10.

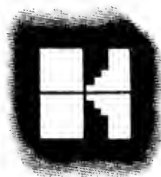


Fig. 12.

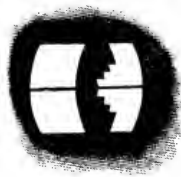


Fig. 13.

diameter is much smaller than the usual type. There is an increased sensitiveness of focus owing to the proximity of the mire, which thus has the advantage of compactness and increased illumination. The pattern is cut out of metal and behind the white opaque glass are fixed the usual electric lamps or gas flames.

The distance between the ends of the hooks is the diameter of the mire. The inner parts of the hooks are used for securing alignment Fig. 15. axis

directions, the outer ends of the hooks are for the purpose of obtaining "contact" Fig. 16. The inner circle does not serve any purpose in ordinary cases of astigmatism beyond giving a definite form and illumination to the image in order that it may be easily found by the observer. It is, however, of use in high degrees of curvature, and also in keratoconus. It is important that there should be no easily disorganised mechanism in connection with the mire, and for that reason there should be an advantage with this pattern in that there is absolutely nothing to disturb or get out of order. The lamps are "commercial," and can be used of low voltage for a battery, or with higher voltages for a city current. The hooks show "touch" when doubled; they are not on the customary "contact" principle, but on that of "opposite points."

The reason for adopting this form of mire is deduced from the two methods that have been employed in ophthalmometry for finding the exact place at which the "doubled" images appear to "approximate," viz:

a) The "contact" system.

This is the one on which the "step" or "Javal-Schiotz" mires are based. The drawbacks to this system are very great. If a square object is reflected into a convex mirror the sides of the image will be seen to be distorted, the



Fig. 14



Fig. 15



Fig. 16

corners of the square being drawn towards the centre. Fig. 10 shows a diagram distorted owing to a reflection, and also one where the usual parallelogram (Fig. 12 or "step" (Javal-Schiotz model) is similarly distorted (Fig. 13). Thus we get two curves, the ends of which cannot form contact at the same time as the centre. The question as to which of these two points must be considered as contact is difficult to decide; moreover, these particular distortions alter with each varying curve of the eye. Another drawback is that it is an extremely difficult matter for any but a careful observer to decide even with straight-sided "steps" as to when "contact" takes place owing to the "nimbus" of light radiating from the illuminated mires. There is present a kind of halo or iridescence obscuring the actual sharp outline of the mire. Add to this the distortion and it will be seen that there are objections to any mire where the images depend upon contact for approximation. In the old days before translucent mires came into use, the "nimbus" was not noticeable.

(b) The point to point system.

The "point to point" system is immeasurably superior to the first method. If we take two straight electric candle lamps, placed end-to-end or tip to tip, above one another, it is quite an easy matter to decide when these points are opposite to each other. Compare this with two curved electric lamps placed side by side with the convex surfaces either in or out. It is difficult to tell when they nearly touch, actually touch, or are slightly overlapped, all due to the "halo" or "nimbus." How much more difficult, then,

when one is in doubt as to whether the ends contact. In Fig. 14 is shown a similar curve or distortion present in the "point-to-point," but as the parts on the horizontal lines only are used, this distortion does not make the slightest difference. There is no distortion with the alignment lines.

Fig. 15 shows the parts of hooks that are used for the purposes of alignment, and Fig. 16 the parts for securing contact on the point-to-point system.

The Doubling and the Approximation.



Fig. 17.



Fig. 18.

By "doubling" is meant the method by which the original image is doubled for the purpose of measurement; by "approximation," the method by which the doubled mire images are made to separate from or to approach each other. This doubling and approximation is of three kinds:—(a) Where the doubling is a fixture and the approximation is secured by altering the size of the object. This alteration in the size of the object is usually secured by moving one or both of the mires laterally (the Javal model) or else by decreasing the size of



Fig. 19.



Fig. 20.

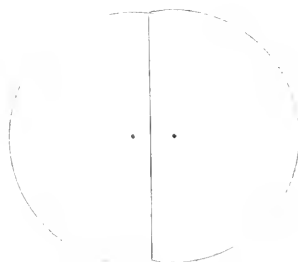


Fig. 21.

the object by a diaphragm, as in the Reid model. (b) Where the doubling alters to obtain the approximation and the mire as an object remains unaltered. (Keratometer model). (c) Where the doubling is stationary and the mire is fixed in size, but where the approximation is effected by moving the mire longitudinally to and fro.*

The objection to the first and third kinds is that the size of the image remains the same whatever may be the curve of the cornea; thus a different

*Proceedings of Optical Convention, 1905. "Satellite" and "Sources of Error in Ophthalmometry."

part of the pupil, a comparatively wider one than the ideal diameter will be measured with a small emmetropic cornea, while a too narrow area will be made with a large emmetropic cornea. There is an objection to instruments where only one of the mires moves in that thus a decentered position of the cornea is measured, while an objection to instruments where both mires move, is that the very slightest movement of the mires is sufficient to account for a large degree of astigmatism. Another objection to movable mires is that the attention of the patient is distracted not only *between* the measurements of the two positions, but also in the measurement of *each* position. This is a point that has hitherto escaped notices.

The second kind, the stationary mires, does not possess these drawbacks. To this class belong those effecting the approximation by means of movable prisms. The keratometer has a fixed mire, the size of the image being different with every varying curvature. The size of this image is proportionate to the curve of the cornea.

The doubling arrangements in corneal measuring instruments invariably consist of an objective, across the face of which is placed some combination of prisms whereby the original image is split into other images of less intensity. The methods of doubling may be classified as under. It is understood that in these examples a horizontal doubling is spoken of:—

(1) *The single horizontal split.* (a) Two plates of thick glass set at opposite angles. Fig. 17 (Helmholtz.) (b) A lens with split halves, one decentered to the right, the lower half to the left. Fig. 18. (c) Two prisms, one base to the right, the other to the left. Fig. 19.

Although there is good illumination with this pattern, the readings of the instrument will be hopelessly wrong if the focus is not very exact. The alignment for securing the axis is very uncertain. This form is now never used.

(2) *The single vertical split.* (a) A pair of prisms, bases or apices together, the dividing line being vertical. Fig. 20 (Kagenaar). (b) A lens out of



Fig. 22.



Fig. 23.



Fig. 24.

which a centre slab has been taken, the two outer halves joined, the slit being vertical. Fig. 21. (c) Two plates at an angle with the dividing line vertical. Fig. 22. (Hardy.) (d) Two lenses from which the outer edge has been cut, leaving two decentered lenses, junction vertical. Fig. 23. The disadvantages are that as with the first kind, the slightest inaccuracy in focus gives an error easily amounting to over one dioptré. The alignment, however, is always correct. All patterns where the original objective is split call for an almost impossible nicety of adjustment.

3. *The equal zone split.*

Under this heading come the Coccuss and Wollaston prisms. Fig. 24. This system has a correct alignment, and has not the decided and palpable errors of inaccuracy if the instrument is only a trifle out of focus. Anyone, however, but an extremely careful observer is likely to make miscalculations, owing to

the varying separation and approximation due to inaccuracy of focusing. There are many objections to the Wollaston prisms, owing to the comparative losses of light and of brilliancy of image. It is, incidentally, difficult to secure good prisms unless of a rather costly nature. The ordinary commercial Wollaston prism, as found in some of the cheaper instruments, is full of chromatism, and absorbs an undue quantity of light. It is somewhat strange that text-books on ophthalmometry have been content with a description of this as an ideal form to the exclusion of all others.

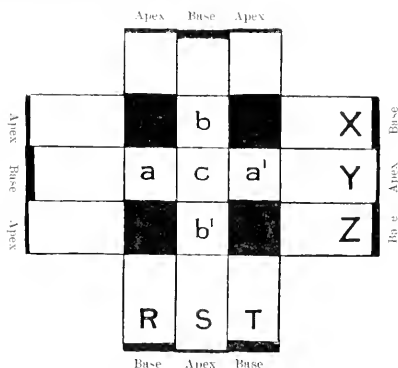


Fig. 25. (Six crossed cylindrical prisms.)

4. *The Rotating Prism (Landolt).* This is practically a Herschell, Cretes, or Risley prism; the two prisms revolve over each other's surface in opposite directions, causing the image to move in a straight line. If in the centre of these two prisms is bored a hole, we shall have two images, one fixed and the other movable.

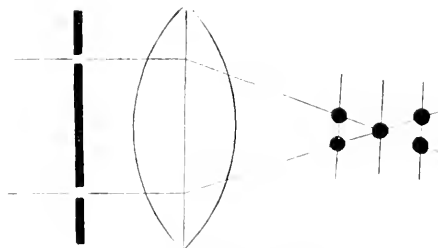


Fig. 26. (The Schott experiment.)

The double split with oblique decentration (Keratometer).

A new arrangement of prisms to effect the doubling and the approximation is used in the keratometer. The first idea was to produce a quadruple image, or rather a duplicated double image, in order that both meridians could be measured without being compelled to swing the arc round, and so distract the attention of the patient. To effect this at first a weak spherical lens was split in two, displacing both halves, thus securing a horizontal decentration and mov-

able double images. At right angles to these was placed a similar combination; this worked well but for the drawbacks previously mentioned of faulty alignment and adjustment, unless the instrument was in exact focus. It was again almost impossible to split and edge a spherical lens horizontally without also introducing a vertical decentration. A split combination was next tried, where the upper half was $+0.25$ and the lower half -0.25 ; by sliding this bodily

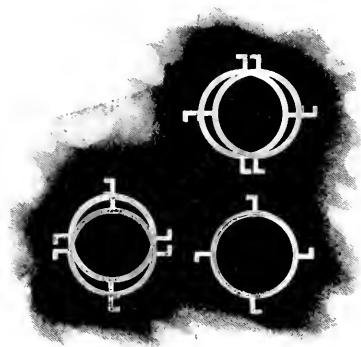


Fig. 27. (*Out of focus*).

transversely to the plane of the objectives, two images were produced moving in opposite directions, the combination, of course, being neutralised by two other half lenses. The same objection as above, however, applied. After long experiments the present system of crossed split cylinders was decided upon.

It is this portion of the keratometer that calls, perhaps, for the most explanation, and that is at the same time the most interesting. A large piece of glass, measuring about 35 cm. wide by about 50 cm. long, has one surface

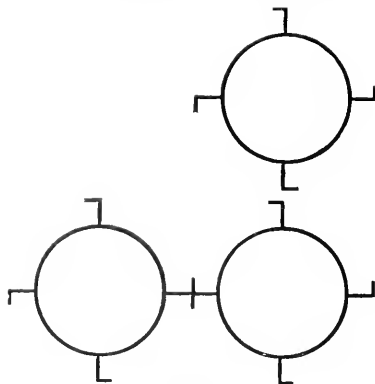


Fig. 28

perfectly plane, the other with the very low curve of about 0.06 dioptré, or about 640 inches focal length. This, no doubt, will be the largest and weakest powered cylinder that has ever been made in an optical manufactory; its production at first was one of the chief stumbling blocks in manufacturing the instrument. From this sheet is cut across the axis a strip 30 cm. long and 35 mm. wide (A) the axis being at right angles to its length.

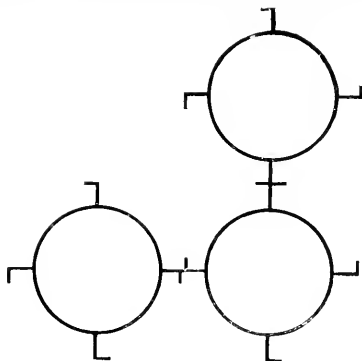


Fig. 20

If we take another piece B similar in every way, but place it over the other and at right angles to it, we have where they cover each other, a +0.06 spherical lens. Holding this in the form of a cross, and looking through the spherical part, if we move one cylinder vertically, the image moves vertically; if we move the other cylinder horizontally, the image then moves in a horizontal direction. Now let us split longitudinally the cylinder A into three equal parts, and move the centre one out or in. We shall have two horizontal images, one of which is fixed, the other movable.

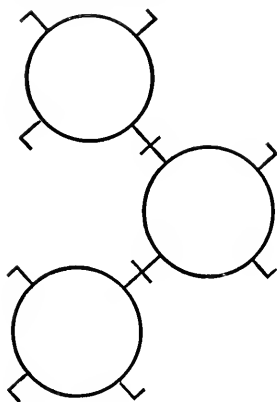


Fig. 30

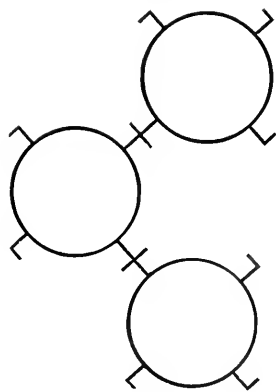


Fig. 31

Let us also split in similar fashion the other cylinder (B) into three cylinders, these being at right angles to the other three.

If we place this six-cylinder combination in front of an objective, we shall have three images, the original image being displaced (1st) down and to the left; (2nd) up and to the right; (3rd) down and to the right. The four corner square holes are blocked out.

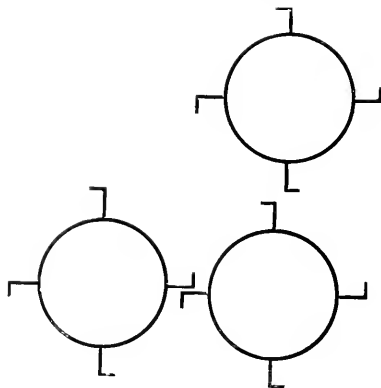


Fig. 32.

A quicker way of arriving at this combination without wasting so much glass is to split the first cylinder (30 cm. by 35 mm.) in half down the axis-centre, this making two equal-sized cylinders with bases together and apices apart. Split each of these into three, take up the centre one of each, turn it over, leaving the two outside slips with apices pointing in the same

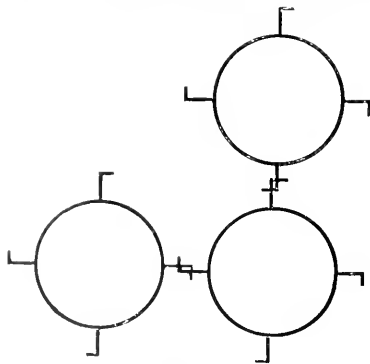


Fig. 33.

direction. If now we cross the two sets we have a combination something like Fig. 25. In the centre we should have nine squares, but by blacking out the outside four we are left with five squares only, the centre one a little larger to compensate for the extra outside areas. Figs. 34 and 35.

Scheiner experiment. Fig. 26. If we stop up the whole of an objective except two holes at some distance from the centre, we shall have one image when the lens is in absolute focus, and two when otherwise. This principle is used in the Thomas Young optometer. The slit taken out of the middle of the combination is equivalent to a slab of opaque material, and thus the two outside lenses give a double image when not in absolute focus.

Considerable importance must be attached to this plan for securing the focus, because not only is it necessary to have a clear focus, but the position must be exact, otherwise the formula of convex mirrors is disturbed. It is not enough that the observer sees the image clearly, he should see it at its correct position.

If we were content with leaving these cylinders in this position, we should have simply three images, but no method of moving them to secure approximation and contact. But if we move the vertical cylinder, the top and corner images will move vertically together; if we move the horizontal cylinder the two bottom images will move together in a horizontal direction.

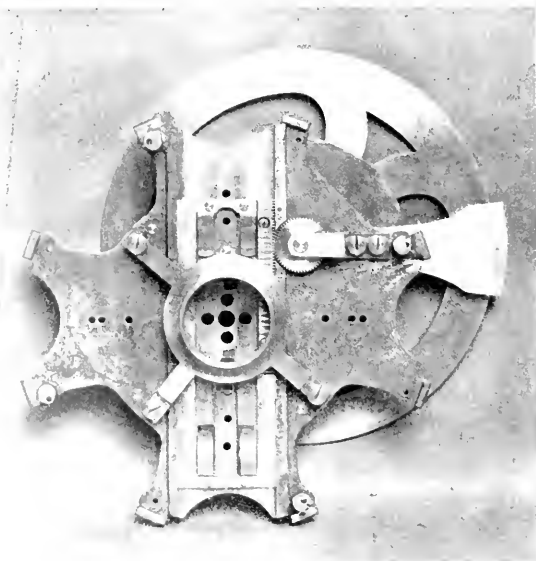


Fig. 33. (Continued)

Not only can one thus secure touch or contact in both meridians simultaneously, without any rotation of the mires, thus abolishing the second position, but a new and important element comes into force; if we are not at an absolute focus the two outside images become doubled, thus making five instead of three. Fig. 27.

Figs. 28 to 33 are line drawings giving a slightly enlarged view of the mire under different conditions.

Fig. 28 shows the keratometer mire tripled, in focus, horizontally in contact, but separated vertically. They are brought together by turning the pointer.

Fig. 29 in contact vertically, but overlapped horizontally. In alignment for horizontal-vertical astigmatism. They are moved horizontally by turning the large engraved dial.

Fig. 30. Oblique astigmatism. Mires in alignment and contact.

Fig. 31. Similar to Fig. 30 but at opposite axis.

Fig. 32. Mires out of alignment, overlapped horizontally but separated vertically. This is corrected by rotating telescope to correct axis, then moving dial and pointer.

Fig. 33. Mires overlapped in both directions and out of alignment.

The Telescope.

The telescope and eye piece do not present much that is new: the front lens is about 10 inches focus, the back one about 15 inches. The convex surfaces of the two achromats are together. The eyepiece can be either Huyghenian or a Ramsden. The cylinders are placed between the two

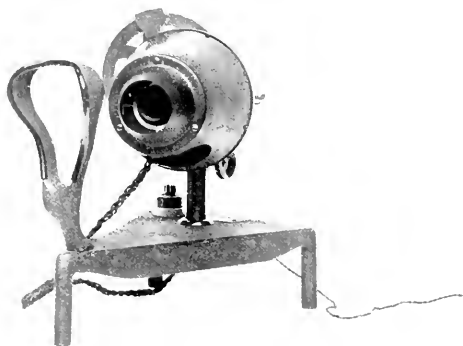


Fig 30. (*Front - view.*)

achromats. The front lens is placed in its focal distance from the patient, the rays then proceed parallel through the cylinders, are collected by the back lens and transmitted to the eyepiece.

The Differential Gear and Mechanism.

The mechanism for moving the centre cylinder of each triple combination consists of two slides on opposite sides of a brass plate. Figs. 34 and 35. Each slide carries the two outside cylinders, the centre cylinder remaining stationary. The slides are drawn by cog-wheels working over a common yet independent centre. One slide is connected with a dial on which the differential figures are inscribed, the other is attached to a pointer. By this means, not only are the separate curvatures of each meridian recorded, but in addition the dial records the actual difference between the two curves, e.g. curves of 47'25 and 49'25 would be registered as 2'00 dioptries: 43'25 and 41'25 would also appear as 2'00 dioptries. There is the further advantage that the instrument automatically registers whether the astigmatism is "with" or "against" the rule. The actual result is thus recorded without any calculation on the part of the operator.

The axis marking arrangement consists solely of an index in the telescope

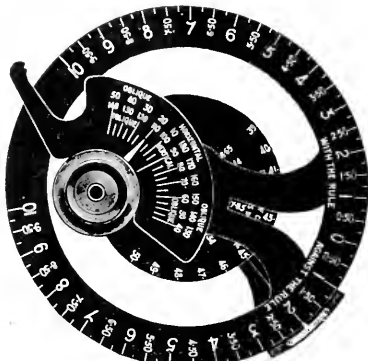


Fig. 37. (*Engraved dial, axis marker, curvature plate, and pointer.*)

tube, pointing to a degree scale. The telescope is revolved by a lever or handle. In no case is it rotated above 45 degrees to either side. Fig. 37.

The Stand and General Design.

The design of the instrument in no way resembles the usual ophthalmometer. Fig. 36. The chin rest has been abolished and an eyebrow rest is provided. If a chin rest is made by resting the elbows on the table, and then resting the chin on the palms of the hands, it will be found that a great facility has been given for moving the eyes about, also that the very slightest pulsation or breathing causes a movement of the upper part of the head and the eyes. If, instead, the two palms are pressed against the forehead near the

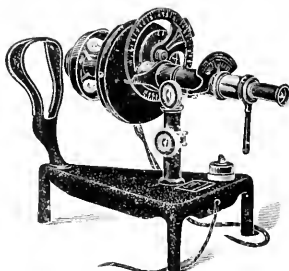


Fig. 38. (*Base and stand.*)

eyebrows, the movements of the chin, mouth, or breathing have no effect; not only that but the pressure of the forehead seems to restrain any desire upon the part of the eyes to move. With children the absence of the chin rest has greatly increased the steadiness. The base is solid, triangular, and has three upright legs. Fig. 38 shows the latter model with exposed lamps to reduce the heat.

The new model is naturally subject to all the theories and laws of ophthalmometry. It is not claimed that it will upset any fixed ideas as to corneal curvatures, or give any particularly new truths, but the study should be unusually facilitated.

CLINICAL MEMORANDUM.

AN UNUSUAL CASE OF GLAUCOMA.

BY

C. DEVEREUX MARSHALL, F.R.C.S.

SURGEON TO THE ROYAL LONDON OPHTHALMIC HOSPITAL; OPHTHALMIC SURGEON TO THE
AP LORIA HOSPITAL FOR CHILDREN, LONDON.

CASES of glaucoma as seen in elderly people are so common as to merit no particular description, but occasionally one comes across a case which is altogether so unusual that a detailed account of it is both interesting and instructive.

The case here recorded is that of William B —, aged 21 years, who had noticed his sight failing for ten months, and in June of 1908 he was seen in Scotland, when it was discovered that his left eye was blind.

He was ordered:—

R.E. —1.0 sph.
—3.0 cyl. axis 180°
—2.0 sph.
L.E. —2.0 cyl. axis 180°

He is an only child, and his father and mother are both said to have good sight and to be healthy. He was admitted into Moorfields Hospital, under my care, when the following condition was found:—

The conjunctiva was healthy; there were a few rather faint scars of old phlyctenular ulceration, but otherwise the corneae were bright; no keratitis punctata; each cornea was 12mm. in diameter; both anterior chambers were deep; the right iris was bright and the pupil active, and the left was also bright but the pupil was almost immobile. Both lenses were clear.

In the right fundus there was well-marked cupping of the disc, not quite reaching the margin. There was venous pulsation, and numerous punctate hæmorrhages were scattered all over the retina. Vision was with sph.-2.5 cyl. -5.0 vert. $\frac{6}{12}$. T. +1 nearly.

The left fundus shewed cupping of 6D., but not quite reaching to the disc margin. The cup was extremely pale, and there were many retinal hæmorrhages, especially along the course of the superior and inferior temporal branches of the retinal artery; the clusters of hæmorrhages were more numerous peripherally. T. +1 or rather more. Vision was hand-movement.

The fields of vision as shown in the appended charts.

On examination, the blood gave the following:

Red Corpuscles	...	...	5,720,000
White	..	...	5,092
Hæmoglobin	...	...	90 per cent.

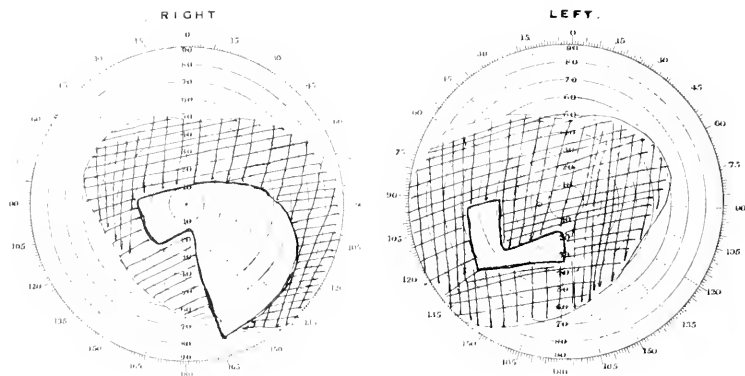
No abnormal cells were seen in the smears. The coagulation time was somewhat prolonged—13 minutes compared with 9 minutes for the method employed. Virtually, the blood examination was negative. The urine had a sp. gr. of 1030, no albumin and no sugar.

The case was seen by several of my colleagues and various opinions were expressed, for it was felt that the risk of an iridectomy was enormous, owing to the likelihood of intraocular hæmorrhage.

Fortified by certain opinions, although discouraged by others, it was finally decided to perform iridectomy in the right or better eye. On January 8th,

1909, the operation was performed. An incision was slowly made with a Graefe's knife and a peripheral iridectomy was done, the eye being meanwhile under the influence of cocaine, as it was felt that the risk of sickness after chloroform was too serious to run. The patient behaved well, and no complications arose. The wound quickly healed, and on January 20th R.V. Sph. $-2\frac{1}{2}$ Cyl. $-5\frac{1}{2}$ 180° all. The tension has not since been above normal, and the wound is perfectly flat. The field, of course, remains much the same as above. The successful result in the right eye encouraged me to treat the left eye in a similar manner, the eye meanwhile remaining in the same condition as before and the tension $+1$ or more.

On February 19th iridectomy was done on the left eye, also under cocaine. The operation went off quite satisfactorily, and the wound has now healed, and although it is not quite so flat as in the right eye, it is rapidly becoming so. The vision remains hand-movement. Cornea bright. No keratitis punctata. Deep anterior chamber, and a wide peripheral coloboma. Field as before, but the tension in neither eye has been raised since the operation.



No fresh hemorrhages have occurred in either. A few old dark-coloured ones are still visible in the right eye, and lighter coloured ones in the left, but nothing recent.

Comments The case is remarkable from many points of view. The age of the patient, only 21, one would think would almost have excluded the possibility of a primary glaucoma, but there was nothing to indicate that the patient had ever had anything the matter with his eyes except one or two phlyctenular ulcers in childhood; there was no punctate keratitis and no sign of past or present cyclitis.

Then, the patient was a myope with large cornea and deep anterior chambers, both of which are exactly the reverse in most cases of glaucoma.

His vision had already failed very considerably, and consequently the greater part of each field had disappeared before one had the chance of operating. There was nothing in the patient's general condition to account for the retinal hemorrhages which were scattered all over his fundus.

The risk of getting intra-ocular hemorrhage while performing iridectomy appeared so great that I very much hesitated before doing it, and I carefully

explained to the patient the facts and the danger he ran, but as it appeared to me his only chance, I advised that it should be done, and the result has shown that I was justified in taking the step I did.

Although it is early to say what will ultimately happen, yet the fact remains that his glaucoma is cured, and that he has had no recurrence of the retinal hæmorrhage since the operation, while in neither eye has the tension risen above normal.

UNIVERSITY OF OXFORD.

Diploma in Ophthalmology.

In a meeting of Convocation, followed by a meeting of the Congregation of the University, held on March 9th last, it was determined to institute a diploma in ophthalmology. The following forms of Statute were promulgated:—

WHEREAS it is expedient (1) to establish an Examination for Diplomas in Ophthalmology, which shall be under the supervision of the Board of the Faculty of Medicine, and shall be open to all persons who have pursued at Oxford a course of study in Ophthalmology, and who either have their names on the Medical Register of the United Kingdom or, being Graduates in Medicine of Universities outside the United Kingdom, have been approved by the Board aforesaid; (2) to empower the said Board to make arrangements for lectures and courses of instruction in Ophthalmology within the University, THE UNIVERSITY ENACTS AS FOLLOWS:—

1. In Statt. Tit. VI, after Sect. VIII (p. 225, ed. 1908), the following section shall be inserted:—

“SECTIO IX.—Of holding an examination in Ophthalmology.

1. There shall be an Examination once in each year in the Theory and Practice of Ophthalmology for the purpose of granting Certificates of proficiency therein. The Certificates so granted shall be styled Diplomas in Ophthalmology.

2. The Examination shall be under the supervision of the Board of the Faculty of Medicine, which shall have power, subject to the provisions of this section, to make regulations as to the subjects of the Examination, the time at which the Examination shall be held, and the conditions of admission, and to make any further regulations which may be necessary for carrying out the provisions of clause 1.

3. The Board shall also have power to make arrangements for lectures and courses of instruction in Ophthalmology to be given within the University.

4. There shall be three Examiners, viz., the Regius Professor of Medicine, who shall be the Chairman of the Examiners, and two other persons nominated, subject to the approval of Convocation, each to serve for two years. In the absence of the Regius Professor, the Vice-Chancellor may appoint some other Professor or Reader in the Faculty, to act as his deputy.

5. The Examiners other than the Regius Professor shall be nominated by a Committee consisting of the Vice-Chancellor, the Proctors, and three persons elected by the Board of the Faculty of Medicine. The tenure of office of the elected members and the procedure of the Committee shall be regulated by the provisions of Stat. Tit. VI, Sect. 1, E §§ 2 and 3.

6. No Candidate shall be admitted to the Examination for the diploma

who shall not have pursued at Oxford a course of study in Ophthalmology approved by the Board of the Faculty of Medicine, and extending over a period of at least three months.

7. The fee payable by a Candidate on admission to the Examination on the first occasion of which he offers himself, shall be £15, unless he is a graduate of the University, in which case it shall be £10. Any Candidate who has paid such fee, and who offers himself for examination again on a subsequent occasion, shall pay a fee of £5 only.

8. Subsequent to the provisions of clause 6 and to any Regulations made by the Board under the provisions of clause 2, the Examinations shall be open to all persons whose names are on the Medical Register of the United Kingdom, and to such other persons, being Graduates in Medicine of Universities outside the United Kingdom, as shall be approved by the Board of the Faculty of Medicine.

9. At the close of the Examination, a list of the Candidates who have satisfied the Examiners shall be made in a book kept for that purpose, and shall be certified by the signatures of the Examiners. This book shall, except when required for the purposes of the Examination, remain in the custody of the Assistant Registrar. The Examiners shall also make and sign a copy of such list, and shall cause it to be affixed the same day to a notice-board at the Schools.

10. To every Candidate who has satisfied the Examiners, a Diploma shall be issued in the following form:—

‘This Diploma is to certify that A. B. has pursued at Oxford an approved course of study in Ophthalmology, and [date] satisfied in the theory and practice of Ophthalmology the Examiners appointed by the University.

C. D., Vice-Chancellor.

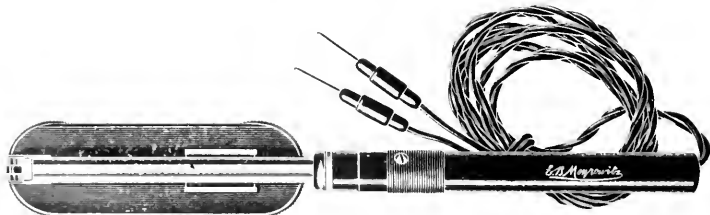
E. F., Regius Professor of Medicine.’

Notice of all Diplomas so issued shall be published in the usual manner.”

THE LONDON OPHTHALMIC EXHIBITION.

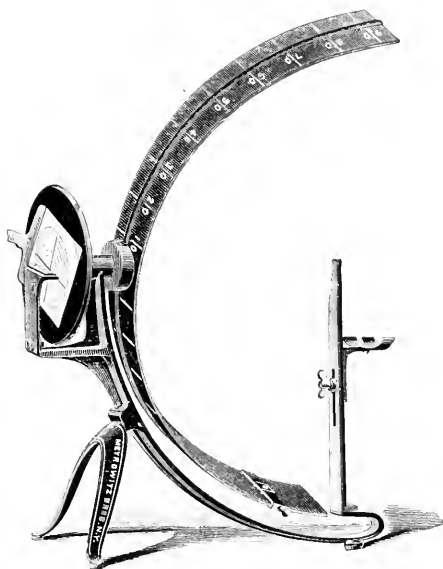
AN Ophthalmic Exhibition, organized by Mr. Ernest Schofield, was held on March 12th and 13th at the rooms of the Medical Society of London, 11, Chandos Street, W. It was well attended, and contained many items of more or less interest to ophthalmic surgeons.

The firm of **E. B. Meyrowitz**, 1a, Old Bond Street, W., exhibited amongst other interesting things, a box of Gowlland (W. G.) lenses which presented



Multiple Motion Electric Ophthalmoscope.

several novel features. The lenses themselves have a diameter of 15mm., and each is mounted in a diaphragm of white metal, which, in the case of cylinders, is inscribed with the various axes. The lenses are plano-convex and plano-concave, thereby allowing a compound correction to be used in the trial-frame with two curved surfaces only, while the maximum thickness does not exceed 3mm. in the optical axis. All the lenses conform to the Optical Society standards, and each lens bears the verification mark of the National Physical Laboratory. The prisms have their bases indicated by a line on the diaphragm, which serves a useful purpose for resultant prisms. The entire case (a full one) is light and extremely portable. Its full specification will be found on p. 250 of the present number. The Bardsley Scotometer, already



Meyrowitz's Perimeter

described in these columns (*see THE OPHTHALMOSCOPE*, 1908, p. 867), was on show. One or two improvements, however, have been made in the original model—in particular, a more satisfactory way of fixing the test object. An ingenious Scotometer, which bears the name of Dr. Ettles, was also on view. Here the fixation objects are tiny iron balls of various colours, and these are drawn across a stretched vertical sheet of paper by means of a small magnet held in the surgeon's hand, concealed from the patient's view by the sheet. The Marple-Morton electric ophthalmoscope (price £5) struck us as one of the best and most convenient electric ophthalmoscopes now upon the market. A simple, well-made and practical perimeter, not liable to get out of order, attracted some attention. It was priced at £3 15s. 0d., and in its general features reminded one of Priestley Smith's well-known model. Edridge-Green's latest apparatus for the detection of colour-blindness was on show. The device consists of a

circular metallic box, about 10 inches in diameter and a few inches deep, which contains an electric lamp beneath a circular opening. In front of this aperture coloured glasses can be placed by moving certain levers attached to the instrument. Its outstanding advantages are that its readings are independent of the colour-vision of the examiner, and that a great number of colours can be presented in the form of an illuminated disc, the image of which may be made to subtend any angle by varying its distance from the subject. The apparatus is extremely portable. The MacNab retinoscope, already described in *THE OPHTHALMOSCOPE* (1908, p. 81), attracted some attention.



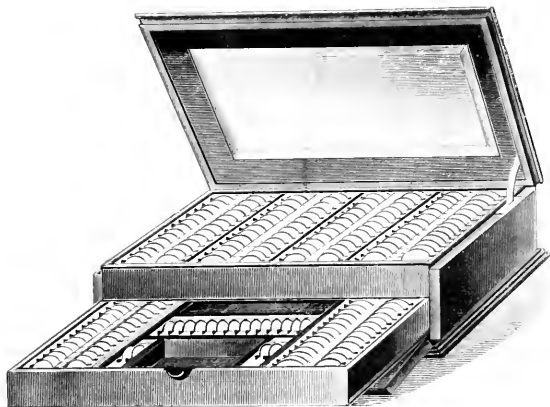
Edridge-Green's Colour Test.

Surgical instruments were admirably presented by **Messrs. Down Bros.**, and **Messrs. John Weiss and Son, Limited**. Amongst the newer eye instruments shown by one or other of these firms, we noticed Lagrange's scissors for his operation of sclerecto-iridectomy, Rollet's *rugine tranchante* for excision of the lacrymal sac, Bardsley's needle-holder, Worth's advancement forceps, and Stephenson's retractor for excision of the lacrymal sac. Other exhibits were various diaphanosopes, Harman's diaphragm test for binocular vision, Berger's *loupe*, trial frames, lenses, and test-types.

Chemical and pharmaceutical products were shown by **Mr. W. Martindale** of 10, New Cavendish Street, W., and by **Messrs. Duncan, Flockhart, & Co.** of Edinburgh and London. The former exhibited sterilised dressings, eye-pads, and ophthalmic operation sets, steriles, and solutions in castor oil of the various alkaloids employed in eye work. This attractive stall was well worth a visit. Messrs. Duncan, Flockhart, & Co., exhibited their so-called "ophthalmic capsules"—that is to say, small flask-shaped receptacles of gelatine for eye ointments. A simple wire mask for the administration of chloroform during operations on the eye was well worth its price, namely, 3s. 6d.

Messrs. C. W. Dixey and Son, of 3, New Bond Street, and 20, Welbeck Street, W., had an attractive selection of optical novelties. A handsome mahogany trial-case came in for a good deal of attention. The lenses were arranged on moveable trays, ample space being left between them for handling and cleansing. In the top tray convex and concave spherical and cylindrical lenses of the same power were placed in the same horizontal line, thereby facilitating the ready selection of a required glass. In accordance

with the requirements of the National Physical Laboratory, the convex lenses were of such a power as to be perfectly neutralized by the corresponding concaves. The tinted lenses, moreover, were calibrated by the percentage of light transmitted by them (Optical Society's Standard). Lenses above 10 D. were worked specially thin—the minus ones by chamfering and the plus by reducing their diameter to $\frac{1}{4}$ inch and by letting the lens into a xylonite rim. The price of the trial-case was £12 12s., and for an extra cost of 30s. a



Dixey's Trial-Case.

National Physical Laboratory certificate was furnished. Other appliances on view at Messrs. Dixey's stall including the Maddox prism verger,* a lens-setting instrument, a case of prism batteries, a stereoscope with rotatory prism attachment for muscle exercise, samples of the "Kryptok" fused bifocal lenses, the Sutcliffe trial-frame with an ingenious nose fitting, Stephenson's illiterate test-types with electric attachment, a spectacle frame specially adapted for babies, and a rotatory test-types with box attached for estimating heterophoria.

Mr. A. Hawes, of 79, Leadenhall Street, E.C., and 49, New Cavendish Street, W., had a handsome show case of spectacles and lenses, amongst which we noticed the "Newform" lenses for deep myopic work, and a box of Steinheil's cones. The former have a very thin cemented segment, three-quarter moon-shape, enabling the distance vision to be used under the reading portion. These lenses were also shown in blue, smoke, Ficuzal, and amber tints.

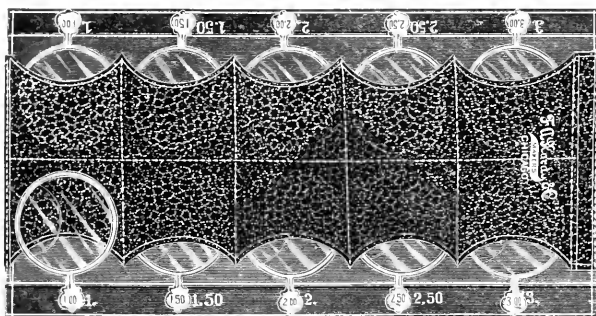
A muscle testing chart was exhibited by the inventor, **Mr. L. L. Liebermann**, of 16, Upper Brook Street, Manchester. It was designed with a view of avoiding calculation by furnishing a graphic representation of measurements in cases of muscular imbalance.

Messrs. F. Davidson and Co., of 29, Great Portland Street, W., exhibited many optical contrivances of interest to surgeons, including a new and cheap self-regulating perimeter, ophthalmoscopes, amblyoscopes, photometers, retinoscopes, corneal platyscopic magnifiers, trial cases, and so forth. A combined

* See THE OPHTHALMICOP, 1907, p. 314.

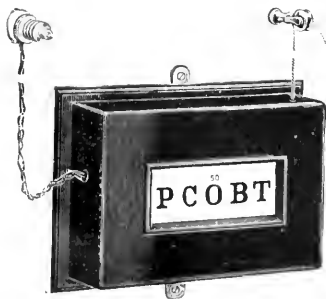
lens-measure and axis-finder (price £2 2s. 6d.) attracted attention, and appeared to be well-adapted for its purpose. Remy's diploscope was on view at Messrs. Davidson's stall.

Mr. Sidney Richardson (12-13, Henrietta Street, Strand, W.C.) showed several more or less novel appliances, perhaps one of the most interesting of which was a Stigmatometer, price £25. By this instrument it is claimed that the total refraction of the eye can be rapidly estimated. A screen is focussed upon the fundus of the patient's eye, and when this is seen clearly by the surgeon, the correction required is marked upon a scale. By revolving the

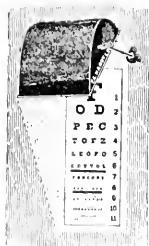


Set of Bifocal Lenses.

screen, which consists of parallel lines, any astigmatism that may be present is ascertained, and the total amount, together with the axis, can be read off. The Stigmatometer is a purely objective test. A curious and, truth to tell, rather a weird exhibit was the Curtis "Motion Target" for use in objective examinations of the refraction. By riveting the patient's attention on this revolving coloured device it was claimed that accommodation could be temporarily placed in abeyance, so that the static refraction could be estimated by the ordinary means. The de Zeng luminous ophthalmoscope and retinoscope, both of which can be carried in the pocket, were also on show. A trial set of five pairs of bifocal lenses, meant to be used in conjunction



Fetting Cabinet.



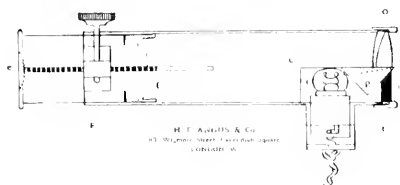
Paradoxe Reflector.



Cross-Cylinder.

with the distance correction, was on view. The upper part of these lenses is, of course, plane, and the lower segment convex, ranging from *plus* 1 D. to *plus* 3 D. The idea is distinctly good, inasmuch as it allows the patient to acquaint himself with the advantages and disadvantages of bifocal lenses before he leaves the surgeon's consulting room. The lenses, as fitted into a flat and very portable leathern case, can be obtained for 17s. 6d. Another useful device in the shape of de Zeng's rotatory cross-cylinder (price 63s.) was also shown by Mr. Richardson. The "Twentieth Century Testing Cabinet" (price £2 2s.) is worth the attention of ophthalmic surgeons unacquainted with its merits. It is an oblong wooden box lighted from behind, and having the test objects—letters, fans, or dots, as the case may be—framed in front. Only one line of a few letters is exposed at a time, and it can be changed quickly by means of a cord and balance-weights. The advantages of this plan are obvious, especially when dealing with dull patients. Frank's parabolic reflector for illuminating ordinary test-types (see THE OPHTHALMOSCOPE, 1907, p. 751) is another device worthy of attention. Its price is 50s.

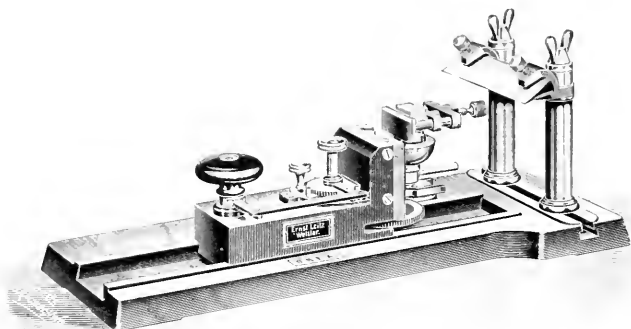
Messrs. H. F. Angus and Co., of 83, Wigmore Street, W., had several novelties, among which we may direct attention to the Baum ophthalmofunduscope and to a most ingenious frame-fitting instrument. The ophthalmofunduscope (an uncount name, by the way) essentially consists of an



Baum's Ophthalmofunduscope.

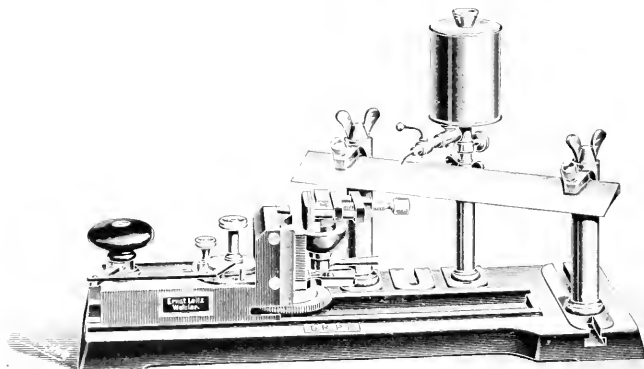
inverting telescope giving a magnification of 2, the object glass being of the usual 2-inch achromatic type, carried in a tube 5 inches long, which also carries a Huyghenian eyepiece fitted with a rack and pinion focussing adjustment. The object glass is cut in two and the space that would be occupied by the half removed, is filled with a light box provided with a 4-volt Osram lamp, and a right angle prism mounted in such a manner, hypotenuse, coincident with the optic axis of the instrument that a powerful beam is projected from a narrow slit about 1 mm. in width, one edge of which is formed by the diaphragm which separates the object glass from the light box. The instrument, arranged as above, gives a brilliantly lighted picture of the fundus under a magnification of thirty diameters. Higher powers even can be obtained by suitable eye-pieces.

The frame-fitting machine is for the purpose of taking certain facial measurements. It is a most ingenious contrivance. The back plane of the glasses and the horizontal line bisecting the pupils are used as datum lines, and the correct position of the bridge is afterwards deduced by graphic methods on squared and protracted charts. This instrument would be useful to ophthalmic surgeons practising in places where a skilled optician was not to be found. He would merely have to chart the measurements and forward them to an optician in London or elsewhere who worked with the Angus machine. The same firm demonstrated their method of taking a plaster cast of the nose in specially difficult cases and of fitting pince-nez by this aid. A clever little device was an interchangeable pad, easily adjusted or removed,



Leitz Microtome.

for the plaquets of pince-nez. Glass impervious to x-rays was shown, and so were microscopes, microtomes, and microscopical reagents. The Leitz Base Sledge Microtome, price £12, struck one as a good instrument. A Berger binocular loupe, with black London straw mount, was listed at 12s. 6d.



Leitz Microtome

Rimless spectacles and pince-nez of high quality, and interchangeable spectacles and eyeglasses were shown by **Mr. M. B. Bloom**, of 51, Bedford Street, Strand, W.C.

Mr. G. S. Martin, of 53, Margaret Street, W., exhibited lenses and spectacle frames

Sutcliffe's well-known Keratometer was shown and demonstrated by **Messrs. George Culver, Limited**, Pentonville, London. A full description of this clever contrivance will be found on p. 235 of the present number of **THE OPHTHALMOSCOPE**.

The Exhibition, although not large, attracted many visitors, and it is hoped that it will be made an annual affair in the future.

NOVELTIES.

A NEW TRIAL CASE.

The "W. G." system of trial case lenses.

The trial case has been for years the ophthalmic surgeon's greatest trouble. No matter how carefully the patient may be tested, he can never make sure that the correction which he orders will carry out his findings.

There are many reasons to account for this. We purchase a trial case, it may be a most expensive one or a cheap one, it does not matter; the lenses contained in it are more or less made up to neutralise, and as long as they do this, they are considered to be correct.

Now, if accurate measurements be taken of the focal lengths of these lenses, it will be found that the positive lens throughout the case must be weaker than the negative to neutralise, until we come to the positive 20D. which is only about 18.4D.

Then, again, we cannot say if the optician to whom the prescription is entrusted has a case of lenses which will neutralise with the surgeon's case, and unless this be so, careful testing is almost thrown away; although an optician may faithfully carry out the correction according to his own lenses, the patient does not get the relief he should, and soon has his own ideas of the matter.

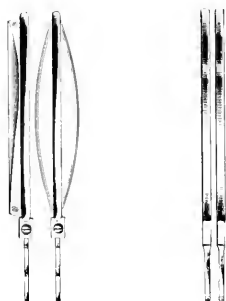
Another point, supposing we have a positive 20D. sph. combined with a positive 8D. cylinder in our trial frame, and we consider it the correction



required, it is easy to see that when the prescription is carried out by the optician, the result must vary very considerably from the correction in the trial frame, owing to there being 3 curvatures and a large increase in thickness to take into consideration, whereas the glasses as made up will only have 2 curves and certainly less than one-quarter the thickness. Other points can be readily found in which the ordinary trial case fails in its usefulness.

The only method by which accuracy can be assured is to use a set of trial lenses of definite focal lengths, accurately tested and passed by the National Physical Laboratory as in accordance with its standards. Such a system of trial case lenses, the "W.G.", have just been put on the market, and not only do they cover all these difficulties, but have also a number of other advantages over the old-style case. They consist of a set of plano-concave and plano-convex lenses of a uniform thickness on the optical axis of 1 mm., and are of a 15 mm. diameter mounted in a metal diaphragm of the usual

diameter, $1\frac{1}{2}$ inch. The cylindrical lenses have the standard notation engraved around the lens, which ensures absolute accuracy as regards the axis. The prisms have the base line engraved on the mount. The small lenses do not cut down the angle of vision, nor do they steam in using, and when a combination is placed in the trial frame with their plane faces together, it is in no way different from the actual lenses the patient will eventually wear, there being only two curved surfaces, and a thickness of not more than 3 mm. They are, of course, very much lighter than the ordinary trial lens; also, they can be rotated with ease and always stand in the frame vertically. A glance at the illustrations showing the old and new style will suffice to explain these points.



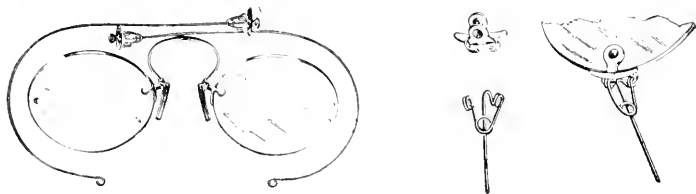
This system will save time, and will also help towards more accurate work, both from oculist and optician. It will be quite impossible to use the same P.D. for reading and distance, as is more often done with ordinary trial lenses. By having lenses made to a definite Government standard the optician will know exactly what he has to work to, and if you prescribe a 1 D. sph. he will know that the lens will have to focus at a point 100 cm. Until this system was perfected, prescription work has been in a state of chaos, although both oculist and optician did their work faithfully. This Government standard system should remove all these troubles. By placing the two letters G.S. (Government standard) on the prescription, you can rest assured that the optician knows exactly the actual lens and can carry out the prescription with an accuracy which has not been possible hitherto.

The case can be seen at, and further particulars obtained from, E. B. Meyrowitz, either in London (1A, Old Bond Street, W.), Paris, or New York.

INTERCHANGEABLE SPECTACLES AND EYE GLASSES.

A useful invention has been brought to our notice by Mr. Sidney Richardson, of 12-13, Henrietta Street, Strand, London, W.C. It can be obtained from any optician. It will appeal to all wearers of glasses.

As may be seen from the illustration, it consists of a pair of detachable sides that may be fastened to any eye-glasses to make them secure while golfing, riding, or engaged in any form of sport. They are very useful, too, on windy



days. The form illustrated, "The Roosevelt," necessitates a small mark being made on the lenses, while another form, "The Presto," can simply be slipped on or off the lens without any preparation.

REVIEW.

CELL INCLUSIONS IN TRACHOMA.

BY

ANGUS MACNAB, M.B., F.R.C.S.,

LONDON, ENGLAND.

FOR many years the bacteriological examination of the conjunctiva in cases of trachoma has given either an admittedly negative result, or one which has later proved to be fallacious; and with every succeeding research the probability that trachoma is not due to the presence on the conjunctiva of bacteria of the ordinary type has increased. During 1907 and 1908 investigation has been directed towards the protozoa, and results have been obtained which are of great interest. Drs. Prowazek and Halberstädter (*) reported in 1907 that they had observed the presence of certain peculiar granules in the conjunctival epithelium of trachomatous patients.

Professor Greeff (b) in the same year independently observed double granules in the secretion, and in the granular cells (Leber) of the trachomatous conjunctiva. These granular bodies have been variously named Clamydozoa, trachoma bodies, cell inclusions, etc. For the present, perhaps the name Prowazek-bodies is the least committal. Professor Greeff calls them "*Trachomkörperchen*", and naively adds "*ein Name der nichts präjudiziert*."

Professor Greeff reported his results at the Heidelberg Conference in 1907, and again in 1908, stating that there was not a shadow of doubt that these 'bodies' regularly occurred in suitable cases of trachoma. He also (1908) described some modifications in staining methods. The discussion which his communications aroused brought out a variety of opinions. Krüdener and A. Leber considered the bodies to be regularly present in trachoma; the latter would only accept the somewhat complex arrangement of the granules near the nucleus as diagnostic. Erdmann found cell inclusions common in trachoma, but in other forms of chronic conjunctivitis he also met with granules which could not be certainly distinguished from these trachoma bodies. Römer found the bodies with such irregularity and uncertainty that they quite failed, in his view, to possess any diagnostic value.

The question of the significance of these 'bodies' has been taken up in Japan, and is discussed in a paper by Mijashita (*), who examined five trachomatous conjunctivæ, three of which had been artificially inoculated. The 'bodies' were present in all five, being found in the epithelial cells during the early stages. In artificially inoculated cases they were not found during the seven or eight days of the incubation period; they appeared in considerable numbers when the disease broke out; and disappeared under treatment.

Mijashita concludes "that the typical Prawozek bodies are specific for trachoma." The opinion of Japanese ophthalmologists varies. The question was brought up before the Japanese Ophthalmological Society by Kiribuchi, who accepts the granules as being trachomatous; he was opposed by Professor Kodama and others, speaking on the results of their own researches.

The position then, is that in certain of the cells from the trachomatous conjunctiva peculiar granules have certainly been observed, when the scrapings or secretions have been stained by Giemsa's methods. These granules are not easily demonstrated. In certain non-trachomatous conjunctival discharges granules have been found in the same kind of cells when stained in the same way. So much is established. Some observers say that the granules in trachoma have a peculiar arrangement and staining which allows a practised observer to recognize them, and in suitable cases to diagnose the presence of trachoma. Other no less careful and critical pathologists say that they are quite unable thus to differentiate these granules, and that they have found in non-trachomatous cases appearances which the others claim to be trachomatous.

It is obvious that this question as to the presence of the granules will soon be solved, as it requires only an adequate number of pathological examinations of suitable cases by observers with some experience in the staining of granular inclusions in cells.

The evidence available at present is in favour of a connexion between certain granular bodies in the cells, on the one hand, and the presence of trachoma, on the other.

What, then, are the appearances, and how can these Prawozek-bodies be recognized? The last writer on the subject, Mijashita (*), may be referred to for their description, as he is an advocate of their specific nature in trachoma.

Films from the secretion, or, better, the scrapings from the epithelium, are fixed in equal parts of alcohol and ether for 5-10 minutes, and stained by Giemsa's new method for 1-3 hours. Only recent, untreated cases of trachoma should be examined. The granules are then seen as round or oval bodies, varying in size up to that of small cocci, sometimes lying in pairs. They are violet in colour, sometimes tending towards red. They stain faintly with aniline dyes, and are Gram-negative. They may be free in the secretion, in the follicle cells, or in the epithelial cells. A considerable amount of experience is necessary to distinguish them from other granules, and this is given as the reason for the difference of opinion amongst observers.

The typical Prawozek-body consists of a mass of these granules in the form of a cap near the nucleus but separated from it by a clear space. This is alleged to be a stage in the life-history of the parasite, and the varying appearances and arrangement of the granules, present the other stages, the cycle of which is still undetermined.

It is clear that much investigation is necessary before this hypothesis can be either accepted or rejected. It is extremely difficult to describe the diagnostic differences between two objects which resemble each other closely,

as we know from the case of the B. xerosis and B. diphtheriae, which, however, many bacteriologists can differentiate with certainty. If Professor Greeff claims that he can distinguish these trachoma bodies, the fact that other skilled observers have not been able to do so, is not evidence that he is working under a delusion. On the other hand, the long and animated controversy which raged on parasitic cell inclusions as the cause of malignant growths, warns us to feel our way very cautiously where a somewhat similar cause is advanced for another disease.

LITERATURE.

- (a) **Prawozek und Halberstädter.** "Über Zelleinschlüsse parasitärer Natur bei Trachom." *Arch. aus dem K. Gesundheitsamt.*, 29, B1. 1. "Zur Ätiologie des Trachoms." *Deut. med. Woch.*, 1907, No. 32.
- (b) **Greeff.** "Die Entstehung und Entwicklung des Trachoms." *Arch. f. Augenheilkunde*, 1907, B1. 58, p. 52. "Eigentümliche Doppelkörnerchen (Parasiten) in Trachomzellen." *Deut. med. Woch.*, 1907, No. 23. "Über Doppelkörnerchen in Trachomzellen" (with discussion). *Ber. d. O. Ges.*, Heidel., 1907, p. 97. "Weiteres über unsere Trachombefunde" (with discussion) *Ber. d. O. Ges.*, Heidel., 1908, p. 100.
- (c) **Mijaschita.** "Über die sogenannten Trachomkörperchen." *Klin. Monatsbl. f. Augen.*, 1908, p. 620 (quoting some Japanese work).
- (d) **Axenfeld.** - *Bacteriology of the Eye*, translated by Angus MacNab, 1908, p. 261 and p. 18.

TRANSLATION.

ON DISINFECTION OF THE HANDS IN OPHTHALMIC OPERATIONS.*

BY

J. WEHRLIN.

THE following investigations serve to show that the methods usually adopted in the preliminary disinfection of the hands and arms for ophthalmic operations do not remove the danger of subsequent infection of the instruments and the eye, if the operations are performed with moist hands and arms and moist instruments. It is a well-known fact that the time allowed for disinfection of the hands and arms before operating on the eye is often shorter than before general surgical and gynecological operations, where this process often takes as long as half-an-hour. And, further, few are likely to deny, that a large number of ophthalmic surgeons still operate with wet instruments, hands, and arms. Now, the surgeon who takes up wet instruments with dripping hands and arms must reckon with the following possibilities:— If the instrument is taken out of an antiseptic fluid, or if the arm is wet or dripping with a disinfectant, then on passing the instrument into the eye, some, although perhaps not much, of the antiseptic will come into contact with the sensitive tissues of the eye and may thus play a part in the causation of post-operative inflammation. A point of still greater importance is the following:—as far as I am aware, the question has not yet been considered, as to whether organisms which have been dislodged in the process of disinfecting, but have not been rendered harmless, may not be carried down the arms and instruments to the eye, and that perhaps more quickly and easily than is generally supposed. It was for the purpose of settling this question that I undertook the following experiments, and although my investigations do not bring out anything new in principle as regards the methods

*Translated from *Archiv für Augenheilkunde*, February, 1909.

of disinfecting and preparing for operations, still I have thought them worth recording.

The question, then, was this: if, in disinfecting our hands and arms, some fluid should reach a part not thoroughly disinfected, might it not be possible for organisms to be carried from there quickly and easily down the arm and along the instruments to the eye? If it could be shown that it was possible, then there was a weak point in the method of operating with moist arms and instruments, one which would merit careful consideration in connection with the pathogenesis of inflammation following operations.

The next question would be, whether such a danger could not best be avoided by operating with dry hands and arms and dry instruments.

In order to be able to judge for myself, I proceeded as follows.—I first disinfected my hands and arms; then rubbed in a suspension of a germ which could be easily recognised; then disinfected arms and hands according to Fürbringer's method; and, finally, inoculated plates and tubes either with wet hands and instruments, or with dry hands and wet or dry instruments, so as to ascertain whether, and if so, in what quantities, the germ had found its way from the hands to the instruments and the media.

I invariably used Fürbringer's method of disinfecting in the chief experiments, and also applied it in nearly all of the serial experiments, so as to have a method which was comparable to those adopted in practice, and one which at the same time admitted of comparisons being made under varying conditions. I did not intend, of course, to find a method which would guarantee the hands being sterile. Numerous investigators have already shown conclusively that it is not possible at the present time to effect absolute sterility of the hands by a process of disinfection.

As regards the mechanical cleansing of the hands, for which Fürbringer allows a choice between sterile water and sterile soda lotion, I used the former, employing a brush with plenty of potash-soap. The antiseptic was perchloride of mercury, 1:1000. Brushes, cloths, and towels were sterilized each time before use in the autoclave for 10 min. under a pressure of two atmospheres, and the instruments were boiled for 10 min. in water containing some soda.

For the plate cultures I chose especially *bacterium prodigiosum* and *bacillus subtilis*, also yeast and *staphylococcus aureus*. For the bouillon cultures, as far as artificial infection was concerned, I used suspensions of spores of *bacillus subtilis*, as it is easily recognized by the characteristic film it forms in bouillon, and because it can be used in smaller quantities, owing to its greater powers of resistance. *Bacterium prodigiosum*, we know, does not stand high temperatures; even warm water of a temperature which can just be borne by the hand, is sufficient to kill off the majority of these germs during the mechanical disinfection. Experiments with *staphylococcus aureus* had to be given up, as the first experiment caused a severe furunculosis of both forearms.

In order to prevent any contamination of the plate cultures with perchloride lotion remaining on the hands and arms, disinfection was followed by bathing in salt solution, according to Fürbringer, and then in sterile water. If perchloride lotion had got into the cultures, it would, no doubt, have hindered the development of the germs more than in a wound where diffusion is easier.

Before taking hold of the instruments, any superfluous water was of course, shaken off the hands, as is the custom in operating. Further, to obtain clear and unexceptional plate cultures, it was found to be an advantage, first to shake off any drops which might appear at the point of the instrument, and so prevent the colonies from coalescing as far as possible. This enabled us to obtain an idea of the proportion of successful inoculations.

As a rule, several series of inoculations were grouped together, so that comparisons might be made between individual experiments. The same group of experiments was repeated later on, the order of the experiments being reversed, so as to enable us to compare the groups.

Controls were made for every experiment, both with regard to the agar and the bouillon, as well as the instruments and the air of the room. We need hardly say that only those experiments were accepted as fully satisfactory in which the controls were negative.

It will be readily understood that any two series of experiments might not yield exactly identical results, although their significance would be unmistakably the same.

I now come to the experiments themselves. Particulars of some of them are given in the following tables:—

Columns 1 and 3 supply the answer to the first question, whether germs on the hands and forearms can find their way easily along the instruments to the wounds or media in spite of disinfection. That this is so is shown by the experiments in the first column; they also show that the time during which the germs may reach the wound is extraordinarily long, being as much as nine minutes.

The columns 2 and 4 give the experiments with dry hands, the instruments being wet or dry, and testify to the surprising fact that all the tubes and plates remained sterile. The tables show further that what applies to the artificially infected arm, applies equally to the arm under natural conditions.

Column 5 gives a rough idea of the number of germs, which, after coming from the hands, developed on the plates. The experiments recorded in this column represent those in which the figures differed most widely. They support the view that the number of germs also on comparatively clean arms varies within wide limits.

Columns 10 and 11 also demonstrate the certainty of the results obtained by drying.

In columns 12, 13, 14, 15, 16 and 17 to 19, simple mechanical cleansing is placed opposite Fürbringer's method of disinfecting, and here it will be seen, the results are scarcely less certain after the former method than after the latter, *i.e.*, the tubes inoculated with dry hands (with wet or dry instrument) are sterile.

When these experiments, including those in columns 10, 11, 20 and 21, are compared, it seems very obvious to infer, that in an emergency, it would be better to operate with hands insufficiently or not disinfected, but dry, providing the instruments were quite sterile, than with hands passably disinfected, but wet.

A comparison of the groups comprising 8, 12 to 14, with 9, 15 to 19 show that the diminution in the number of germs is pretty even. Thus, column 8 shows remarkably fewer infections than column 9, so that in column 12 there are barely two infected tubes, whilst the corresponding column 16 in the second group still shows considerable infection. In the first group in which the natural infection was comparatively mild, further disinfection has sufficed to effect absolute sterility of the tubes (column 14), while in the corresponding series of the second group (column 19) the germs have not been entirely got rid of.

The experiments show further that the state of the instruments, whether wet or dry, is not of decisive importance, although sometimes the wet instruments are at a disadvantage.

The results, therefore, of my investigation are as follows:—

If we infect our arms, organisms can run down the arms, hands, and

ANTHELMINTIC TREATMENT				NATURAL INFECTION				NATURAL INFECTION				NATURAL INFECTION				NATURAL INFECTION			
Time, min.	Running number of inoculation	Number of inoculation	Time in minutes	Hands dry, instrument dry	Hands dry, instrument dry	Hands dry, instrument dry	Hands dry, instrument dry	Time in minutes	Hands dry, instrument dry	Hands dry, instrument dry	Hands dry, instrument dry	Time in minutes	Hands dry, instrument dry	Hands dry, instrument dry	Hands dry, instrument dry	Time in minutes	Hands dry, instrument dry	Hands dry, instrument dry	Hands dry, instrument dry
1 min.	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2 min.	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
3 min.	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
4 min.	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
5 min.	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
6 min.	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
7 min.	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
8 min.	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
9 min.	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9

(1) + = positive inoculation result. (2) Each plate was stabbed 80 times within 1 minute. (3) The hands and part of the forearms were dipped in fresh sterile water before inoculating each plate. (4) Percentage of positive results.

instruments in an astonishingly short time and for an extraordinarily long time. A single experiment on oneself is quite sufficient to prove the seriousness of this source of infection.

What holds good for the artificially infected arms applies also to the arm under natural conditions.

The advantage which the ophthalmic surgeon possesses in only needing to touch the wound with his instruments, becomes a certainty only if he operates with dry sterile instruments, and if, after disinfecting his hands and arms, he dries them with sterile cloths.

It is only in this way that the ectogenous sources of infection, as represented by the surgeon and the instruments, can be entirely eliminated.

PERCIVAL J. HAY.

CURRENT LITERATURE.

NOTE.—Communications of which the titles only are given either contain nothing new or else do not lend themselves to abstract.

I—AMAUROTIC FAMILY IDIOCY AND ALLIED CONDITIONS.

- 1) Gordon, Alfred. Cases allied to amaurotic family idiocy. *Trans. College of Physicians of Philadelphia*, Third series, Vol. XXVIII, p. 280; and *New York Medical Journal*, February 16th, 1907.
- 2) Sachs, B.—*Ibidem*. *New York Medical Journal*, March 9th, 1907.
- 3) Buchanan, Mary.—A case of amaurotic family idiocy. *Annals of Ophthalmolog.*, April, 1907.
- 4) Cohen, Martin and Dixon, George Sloan.—Report of a case of amaurotic family idiocy, with histologic report on the eye. *Journ. American Med. Association*, May 25th, 1907.
- 5) Babonneix and Brelet.—Amaurotic family idiocy. *L'Idiotie amaurotique familiale*. *Gazette des Hôpitaux*, 10 mai, 1908.
- 6) Tchikawa, K.—Upon a disease allied to amaurotic family idiocy and its histology. *Ueber eine der amaurotischen familiären Idiotie verwandte Krankheit mit histologischer Beschreibung.* *Klin. Monatsbl. für Augenheilkunde*, Januar, 1909.

(1) Gordon (Philadelphia) agrees with the opinion expressed by Russell, Kingdon, Poynton, Parsons, and Holmes, namely, that amaurotic family idiocy is due, not to arrested development but to an inherent degenerative condition, primarily of the cells and secondarily of the entire neurons.

The ordinary clinical picture of Tay-Sachs' disease is not always present in its entirety. The symptoms which may be absent are: spasticity, convulsions, or increased reflexes; eye symptoms, the family character, the mental deficiency, and, finally, the early death. On the other hand, cases occur which although they do not present all the important symptoms of Tay-Sachs' disease, show nevertheless most of them. They must therefore be looked upon as allied to that disease. For example, Spielmeyer (*Neurologisches Centralblatt*, 1906) described a special form of amaurotic

family idiocy, in which mental weakness, blindness, and the family character were the only symptoms common to it and Tay-Sachs' disease. Mental deficiency, together with retinitis pigmentosa, developed at the age of 6 years. The patients lived until the age of puberty, when death occurred from intercurrent disease. In two of Spielmeier's patients examined after death, pathological changes were found to be confined to the cells, and the alteration of the nerve-fibres was slight. The affected cells showed swelling and a peculiar granular substance. Spiller (*Amer. Journ. Med. Sciences*, 1905) also speaks of a case which was not quite typical of amaurotic family idiocy, but in which cellular changes were found. The patient lived until eight years of age.

Gordon concludes that amaurotic family idiocy presents several forms more or less different from the original type. In support of this view he reports a couple of cases which occurred in brother and sister, Russian Hebrews. Blindness and mental deficiency were early symptoms. Optic atrophy existed. The thyroid gland showed changes in both the patients. Brief facts of the cases follow:

CASE NO. 1.—Male child, aged 9 years. When he was twelve months it was noticed that he could not see well, and for a long time he behaved like an infant. At the age of five he was sent to school, but he is still in the lowest grade, since it is extremely difficult to teach him anything. *On admission*—The child talks and acts like a boy whose mentality is below average. Markedly obese. The face is very full, but the upper part of the head is small and the forehead is low and narrow. Ears unequal in size; palate is narrow and highly arched; teeth irregular and abnormal as regards size; thyroid gland cannot be felt; cryptorchidia; the right testicle undescended; penis infantile. Boy walks normally, and presents no rigidities or deformities in the extremities. Reflexes normal. Slight instability of the head, which is jerky. Rotatory nystagmus. V. 6/200 improved by correction of the myopic astigmatism to 20/200. Rotation in all directions limited but not absent. Pupils equal and active. Optic discs pale. Large irregularly outlined patch of absorption of choroidal pigment in each fundus, not symmetrically placed. Finally, the lad showed polydactylism of all four extremities.

CASE NO. 2. Sister of above patient, 13 years of age. Blindness noticed at about the age of 3 years. Speech always defective. Although she has attended school for the last six years, she is still in the second grade. Has an enormous appetite—never satisfied. *On admission*.—Child, who began to menstruate at 12 years, spends her time playing with dolls and is extremely apathetic. Extreme adiposity. Forehead low and scalp very thick. Lobes of both ears soldered to the head. Upper teeth widely separated and deficient. Thyroid glands somewhat enlarged. Speech deficient. Nasal intonation of voice. Gait normal. No rigidity of limbs. Knee-jerks increased. V. fingers at five feet. Fields apparently concentrically limited. Rotation of eyes restricted in all directions. Media clear. Optic nerves and retina atrophied; oval area including fovea and about size of papilla, much redder than remainder of fundus. Pupils equal and active.

SYDNEY STEPHENSON.

(2) Referring to Gordon's communication (abstracted above), Sachs (New York) declares that "such misleading statements as are contained in Dr. Gordon's article cannot pass unnoticed." "The cases to which he refers," continues Sachs, "are so widely different from those described by Tay and myself that there is no possible resemblance between those to which he refers and the type to which he thinks they are allied." "All I need say in this connection," Sachs concludes, "is that the youthful patients, suffering from mental enfeeblement and from some form of defective vision, are not necessarily affected with amaurotic family idiocy."

SYDNEY STEPHENSON.

(3) Mary Buchanan, of Philadelphia, reports the case of a male Hebrew child, aged fifteen months, who suffered from amaurotic family idiocy. The youngest of six children, he was the only one affected by the disease. He did not notice things at three months, like his brothers and sisters, and at six months could not sit in a high chair, as they had done. He had never been able to stand alone, nor had had he taken any notice of toys. He had been breast-fed. *On examination*. The child, who was very pale, lay inert in his mother's lap. All his muscles were flaccid. He was unable to take milk from a spoon without choking. He seemed to have a laryngeal obstruction, due, it was thought, either to hypertrophy of the folds just below the true vocal cords or else to a papilloma of the commissure below the level of the

cords. Eyes slightly divergent; fixation absent. Pupils 3mm. and slightly responsive to light. Optic discs white, and retinal vessels, particularly the arteries, reduced in size. At the macula lay the typical cherry-red spot, horizontally oval. It was surrounded by a white arcola, dense towards the centre and fading away towards the periphery. It was about 1.5 D.D. wide and slightly oval.

SYDNEY STEPHENSON.

[4] **Cohen** (New York City) reports a typical case of amaurotic family idiocy in a female child of Hebrew parentage, who died at about seventeen months from broncho-pneumonia. She was one of five children, and the only one affected by the disease. Symptoms dated from five months. The eyes were enucleated $2\frac{1}{2}$ hours after death, and a pathological report by **Dixon** (New York City) forms the major part of the communication. One eye was preserved in 10 per cent. formalin and the other in Orth's fluid. In the former the retina appeared shrunken and thin, whereas in the latter it was more nearly normal as regards thickness. True oedema of the fovea was noted, although for a short distance on each side of the macula the external reticular layer was spaced out, a point repeatedly reported in these cases. Müller's fibres appeared as a conglomerate mass. The multipolar ganglion cells were present in their usual number outside the macula, but they conveyed the impression that they were swollen. Giant ganglion cells were occasionally seen. Both nuclei and nucleoli in the vast majority of the cells were sharp and clear-cut, but generally displaced to the side. Retraction of the cell reticulum was noted, and some of the ganglion cells had disappeared. Nissl's stain showed the reticular network of the remaining cells, but it was usually massed about the nucleus and was more or less scanty towards the periphery of the cell. Weigert's stain showed the same dark granules in the cell protoplasm described by other observers, and also in the so-called amacrine cells. No degeneration of the rods and cones. The optic nerve was in a condition of commencing simple atrophy. Weigert's stain indicated no localized degeneration. The intervaginal space was not at all well-marked. In brief, then, the retinal changes included swelling of the multipolar ganglion cells, displacement of their nuclei, retraction of the cell reticulum, occasional disappearance of the ganglion cells, and general absence of Nissl's granules. Furthermore, they included the appearance of dark granules in all the ganglion cells by Weigert's stain, the peculiar formation of the macula and fovea, the "spacing out" of the external reticular layer near the macula, and, finally, the beginning simple atrophy of the optic nerve.

An autopsy could, unfortunately, not be obtained. SYDNEY STEPHENSON.

[5] From this general review of the subject by **Babonneix** and **Brelet**, it appears that no case of amaurotic family idiocy, or Tay-Sachs' disease, has been recorded in France until quite recently. The object of the writers is to make known to French readers the characteristics of the complaint, and no good purpose would be served by abstracting the article, which appears to contain no new points.

ERNEST THOMSON.

[6] **Tchikawa's** case was that of a Japanese boy, aged seven years, who was affected with amaurosis and idiocy. The parents were first cousins, and two other children of theirs had suffered from the same disease. The first symptoms appeared at the age of five years. Apart from the visual and mental trouble, there were also some motor symptoms of a spastic character. The ophthalmoscope showed optic atrophy of the type associated with retinitis pigmentosa. The fundus, however, was free from pigment; it had only a peculiar granular appearance. The macula appeared as a dark red spot, the size of a quarter O.D. The child died of pneumonia, and the eyes were examined microscopically, with the following results.—The choroid

perfectly normal, some disturbance of the pigmentary epithelium, leading to a fine disseminate pigmentation of the retina, complete atrophy of the rods and cones, slight degeneration of the inner nuclear layer, structural changes in the ganglion cells, and thickening of the walls of the retinal vessels. In addition to these changes, an oblong cyst was found in the ciliary body of one eye; it was one millimeter long, and was formed by the detachment of the inner pigmentary layer of the pars ciliaris retinae from the outer.

Tchikawa expresses the view that his case and all the similar ones reported by various authors are only varieties of one and the same disorder, the severest form of which is represented by Tay-Sachs' disease, and the mildest by simple pigmentary degeneration of the retina without idiocy.*

C. MARKS.

II.—GLAUCOMATOUS EXCAVATION.

Schnabel, W. J.—Clinical time relations in the developmental history of glaucomatous excavation. (*Klinische Daten zur Entwicklungsgeschichte der glaukomatösen Exkavation.*) *Zeitschrift für Augenheilkunde*, April, 1908.

Schnabel (Wien) at a meeting of the Vienna Ophthalmological Society, showed a case in which the papilla was entirely wanting, its place being taken by a hole. Only a small part of the intrachoroideal part of the optic nerve remained, as a thin layer of dark-grey tissue with the vessels of the medial half of the pupil. The optic nerve ended in the sclerotic canal, and in front of its terminal surface lay a steep-walled depression. The anterior border of the pit is formed by the edge of the choroid, encircled by a girdle of decolourised choroid. During the four weeks the patient remained in Schnabel's clinic the ocular tension never exceeded physiological limits. The eye is an example of the disease v. Graefe called "amaurosis with excavation of the optic nerve." There is another form of glaucomatous excavation. In 1876 Schnabel described a case of a woman who had a successful iridectomy performed for an acute glaucoma of four days' standing. The patient left the hospital with no sign of glaucomatous excavation. Two months later total excavation was found. The tension of the eye had remained normal, the visual acuity was unchanged. In another case after iridectomy, while the vision was improving and the tension remained low, a total excavation developed.

The author finds in his clinical records eight similar cases. Thus, the formation of a glaucomatous cup after the high tension has been cured by iridectomy is by no means uncommon, scarcely more so than the first form of excavation without high tension at all.

The third and rarer group contains those cases in which the cup develops while the tension is pathologically raised.

The final result of all three forms has the same ophthalmoscopic characteristics. Schnabel describes the appearance of such a disc. It is practically a *consumption* of the non-medullated part of the nerve. He has watched the process daily with the ophthalmoscope, and has seen a total excavation develop in *eight days*, the lamina cribrosa remaining entirely unaltered in its original position. Iridectomy has been successfully performed, and the tension was normal all the time. The situation of the changes was

*See abstract of Nettle ship and Stock's papers in THE OPHTHALMOSCOPE, 1908, pages 534-536.

that part of the nerve anterior to the lamina cribrosa which is poor in connective tissue and composed of non-medullated fibres. It must, however, be borne in mind that Elschnig* has proved histologically that the disappearance of connective tissue contributes largely to the cup formation. Such examples of glaucomatous excavation should definitely disprove the theory that the process is in any sense an ectasia, due to the action of pressure pushing back the tissue of the optic nerve.

T. HARRISON BUTLER.

III.—X-RAYS AND RADIUM IN DIAGNOSIS AND TREATMENT.

- (1) **Bossalino.**—Experimental researches on the visibility of X-rays. *Annali di Ottalmologia*, Vol. XXXV, fasc. 3-4, p. 254 to 271.
- (2) **Bossalino.**—Another note on the visibility of the X-rays. *Annali di Ottalmologia*, Vol. XXXVI, fasc. 5, p. 364 to 369.
- (3) **van Duyse and Denobele.**—Sarcoma of the orbit cured by radiotherapy. *Bull. de la Société Belge d'Ophthalmologie*, 29 novembre, 1908, and *Archives d'Ophthalmologie*, janvier, 1909.
- (4) **Ewing, A. E.**—Roentgen ray demonstrations of the lacrimal abscess cavity. *American Journal of Ophthalmology*, January, 1909.

(1) The experiments of **Bossalino** (Pisa) would seem to prove that the Roentgen rays are visible to the human eye when adapted for darkness; that the presence of the crystalline lens is no obstacle to their visibility, even when the lens is cataractous; that, on the other hand, it is indispensable that there be no pathological alterations of the fundus. By the X-rays it is always possible to see the forms of metallic objects interposed between tracks scarcely separated by connective tissue fibrils. Bibliography appended from 1880 to 1904.

A. ANTONELLI.

(2) By personal investigations **Bossalino** (Pisa) concludes that in the present state of our methods of experimentation, the Roentgen rays are of no use in the perception of colours, and manifest no influence on the retina acted on by the usual coloured lights.

A. ANTONELLI.

(3) **van Duyse** (Ghent) and **Denobele** (Ghent) describe the case of a lad of sixteen years who had been affected with a disease of the orbit for nine years, and who presented also many growths developed under the skin. As shown by figure 1, there was a voluminous ulcerated and bleeding tumour of the right orbit. The cornea had been destroyed. After four *séances* of radiotherapy, the tumour had half receded (fig. 2); and after 8 *séances* it had disappeared entirely (fig. 3). When the patient was shown before the Belgian Ophthalmological Society on November 29th, 1908, the cure had lasted 5 months. The cutaneous growths present on the anterior and posterior surfaces of the trunk, which doubtless represented so many metastases from the orbital neoplasm, showed the structure of interfascicular endothelial sarcomata. In consequence of the integrity of the skin, they were resistant to the Röntgen rays. One of them, however, situated on the abdomen,

*Elschnig, —*Heidelberg Congres.*, 1907.

disappeared after a fortnight's treatment with radium. In brief, radiotherapy is formally indicated in non-operable sarcomata; it should be applied in recurrent orbital sarcomata; it forms a useful complement to orbital



Fig. 1.
Before radiotherapy
16th May.

Fig. 2.
After 4th appli-
cation.

Fig. 3.
Cure after
8th application.
27th June.

extirpations; certain sarcomata are of an extreme radio-sensibility, and so it is legitimate to commence the treatment of malignant tumours of the orbit by X-rays. Curative doses of X-rays may be applied without imperilling the functions of the retina.

H. COPPEZ.

(4) **Ewing** exhibits a series of four beautiful Roentgen ray pictures of lacrimal sac abscess and one of the normal sac. Bismuth subnitrate in albolene (an oily medium) had been injected in each case, and in two a probe is seen in position. The bismuth causes the recesses of the cavities to show up well in contrast with that of the normal sac, which hardly shows up at all owing to the ease with which the bismuth can get away. One of the plates shows the existence of a pocket at the lower part of the sac which apparently would not be evacuated by the probe and which might be a source of reinfection. Another shows a bulging backward as if there was a tendency to extend into the ethmoid. The method would be very useful for diagnostic purposes in those cases in which the pus of a lacrimal abscess burrows in various directions. For instance, the perforation may occur through the inner wall and may even find its way into the maxillary antrum (Theobald), or it may burrow between the periosteum and the bone, reach the floor of the nose, and establish a fistulous orifice into the mouth through the palatine suture of the palatal bones (Power).

ERNEST THOMSON.

IV.—PLUMBIC OPTIC NEURITIS.

Gibson, J. Lockhart.—Plumbic ocular neuritis in Queensland children.
British Medical Journal, November 14th, 1908.

From **Gibson's** paper, which is largely a synopsis of his 1905 paper in *Transactions Australasian Medical Congress*, 1905, it appears that children in Queensland are peculiarly liable, especially in the summer, to a form of lead poisoning which may give rise to a mistaken diagnosis of basal meningitis or cerebral tumour when the cases are not seen in groups. The poison has been traced to the lead paint used in garden and verandah railings, etc., which after exposure to weather, becomes powdery and easily detachable. The majority of children affected either bite their nails or suck their fingers.

The term *ocular neuritis* is used in order to include the external and ocular nerves as well as the optic nerve. "The disease is characterized by the sudden onset, with or without preliminary colic, vomiting, and constipation, and with or without severe headache, rigidity of the neck, or retracted head and acute pains at the back of the neck, of paralysis or paresis of one or both external recti, accompanied by optic neuritis or choked disc, and unaccompanied by rise of temperature or by albuminuria; accompanied also by the well-known blue line on the gums, by the finding of small but distinct quantities of lead in the urine, by the fact that the patient has access to painted surfaces" Prior to 1897 it was thought that the source of the lead was water from galvanized iron tanks; this was disproved and the source was ultimately found to be the soluble carbonate of lead which is used throughout the colony for out-door painting.

The paper is most interesting and should be read in the original, especially by those who practice in warm climates, for the author believes that cases cannot be very infrequent in warm climates other than Queensland, when similar sources of poison are available.

ERNEST THOMSON.

V.—THE RAPIDITY OF FORM-PERCEPTION.

Guillery.—Experimental measurements of the rapidity of form perception. (Messende Versuche ueber die Schnelligkeit der Formwahrnehmung.) *Arch. f. Augenheilk.*, Bd. 62, Dezember, 1908, p. 227-232.

Guillery's experiments form a contribution to the study of the conditions necessary for true measurement of the form sense. It has been shown that the perception of form does not depend only upon the size of the visual angle; e.g., it is a matter of daily experience that the letters of the ordinary test-types are not all equally well seen, although they may all be constructed upon the same principle. In Guillery's experiments each letter was exposed to view only for one quarter second, an exposure which was found sufficient to recognise the easiest letters at the distances at which they should be seen. In order to recognise the other letters it was then found necessary to approach them; the distances were recorded, and appear in the following table:—

3m.		4m.		5m.		6m.		7m.	
L	2.50	V	3.00	U	3.25	O	5.50	A	5.45
T	1.80	F	2.00	V	4.55	Z	4.50	O	6.25
o	2.20	o	2.70	7	3.0	4	3.0	N	5.90
n German }	2.15	H	2.20	a German }	3.25	X	4.55	H	5.0
Z	2.45	K	3.15	E	3	E	4.0	u German }	5.0
N	2.45	L	3.20	X	3.25	o German }	4.25	5	4.90

The figures above refer to the normal reading distances, according to Snellen, and the figures beside the letters refer to the distances at which the letters were actually recognised. V was always read furthest off. Some letters, generally regarded as easy, e.g., T, presented unexpected difficulties.

L merely looked like a hook, just as when seen at too great a distance, and T looked the same as Y. It is interesting, therefore, to note that the distortion is the same, whether the size of the retinal image is relatively too small for the time allowed for observation, or whether it is absolutely too small.

Percival J. HAY.

VI.—COLOURED VISION.

- 1 Vogt, A.—On the origin of erythropsia produced by glare. (Beitrag zur Frage der Entstehung der Blendungserythropsie.) *Arch. f. Augenheilk.*, Bd. LX., Heft 1, S. 91-92.
- 2 Hess, C.—Blue blindness due to a yellow discoloration of the lens. (Ueber "Blaublintheit" durch Gelbfärbung der Linse.) *Arch. f. Augenheilk.*, Bd. LXI., Heft 1, August, 1908, S. 29-37. Illust.
- (3) Reuss, A. v.—Notes on erythropsia. (Beiträge zur Kenntniss der Erythropsia. *Arch. f. Augenheilk.*, Bd. 62, Dez., 1908, S. 113-131.

1 Vogt finds that erythropsia follows after looking at a snow-field, even when glasses are worn which absorb all the ultra-violet rays, and when all the rays from the sides are screened off. He feels justified, therefore, in contradicting the theory that erythropsia is caused by the ultra-violet rays. P. J. HAY.

(2) Hess discusses the effect on colour-vision produced by a yellow discolouration of the lens. Apparently the point has not been studied before, although the fact that lenses removed for cataract are not infrequently yellow in appearance is a matter of common knowledge. So also is the circumstance that after the removal of a cataract the patient often finds his colour-vision changed. Hess finds that, generally speaking, the yellow colour of the lens, already present at birth, becomes deeper as age advances, though this is not an invariable rule. The effect on colour-vision is the same as when amber-coloured glasses are placed before normal eyes. The author gives details of the case of one of his patients, an elderly lady suffering from "black cataract." She stated that she could not distinguish blue colours very well. Her lens appeared quite transparent, but of a deep yellowish-brown colour. On examining her colour-vision, he found that yellowish-green appeared green to her, blue-green she called dark-green, blue looked like dark-grey, and violet she thought was brown or black. Various experiments showed that her spectrum was very much shortened at the "long wave end," so that she could not perceive greenish-blue, blue, and violet. Without any loss of transparency, therefore, the yellow colour of the lens had become sufficiently intense to cause complete "blue blindness."

P. J. HAY.

3) Reuss has applied the Faradic current in the treatment of erythropsia. In two cases he was successful in curing the condition; in two others he did not succeed.

P. J. HAY.

VII.—PRERETINAL HÆMORRHAGE.

- 1 Galezowski, J. Preretinal hæmorrhages. *Revue d'Ophthalmologie*, September, 1907.
- 2 Nagel, G. S. C. Preretinal hæmorrhage. *Journal of Ophthalmology and the Ear, Nose, & Throat*, January, 1909, Vol. III, p. 1.

(1) The number of cases of preretinal or subhyaloid hæmorrhage observed in France appears to have been very few, and the literature on the subject is largely English and German.

Galezowski (Paris) records three cases: the first was that of a woman, aged 25 years, who suddenly lost the sight of one eye. The ophthalmoscope showed a large, but not very dense, subhyaloid hæmorrhage, which veiled the disc and the retinal vessels over the lower part of the fundus, the extreme lower periphery only being clear and free from hæmorrhage. Some of the blood had escaped through the hyaloid into the vitreous. The lesion was seen to be an obliteration of a branch of the inferior temporal artery. Recovery, with re-establishment of the circulation in the obliterated artery and full vision, took place in three weeks. The second case was in a woman, aged 60 years, who had diabetic retinitis and retinitis circinata in each eye and diffuse hæmorrhages into the vitreous in one eye. The third case was that of a healthy woman, aged 30 years, who showed the typical ophthalmoscopic picture of a subhyaloid hæmorrhage after a severe attack of vomiting (of pregnancy). Vision in the affected eye was reduced to $\frac{1}{100}$.

Galezowski made a histological examination of an eye which had been excised for hæmorrhagic glaucoma, and which showed some retinal, subhyaloid, and vitreous hæmorrhages. He could find only a single membrane bounding the subhyaloid hæmorrhages, which also showed a number of fibrinous filaments darkly stained by the accumulated hæmatinic pigment.

J. JAMESON EVANS.

2. **Nagel** (San Francisco) prefers the term "preretinal" to "sub-hyaloid," and remarks on the condition as well as reporting a case. An exact diagnosis of the condition is essential for a prognosis.

Ophthalmoscopically, in hæmorrhage between retina and vitreous, there is a horizontal straight outline at the upper border, below more or less semi-circular: a change of this straight upper border by inclining the head has been noted. Usually, the macular region is the part involved, accompanied by preretinal hæmorrhages or other fundus changes elsewhere: cases have been reported where the macula was not involved. The source of the hæmorrhage—the retinal veins especially, or the arteries. Changes in the blood, alterations of the small vessels, venous stasis, &c., play a part in its production. Prognosis is good, absorption taking place in from three to six months with good vision. The case is reported in detail: the right eye was involved first, and the condition improved to complete recovery in ten weeks. Twenty-eight days after the onset of the affection in the right, the left also suffered to a less degree, but similarly, with a permanent recovery in seven weeks. In both eyes the macula was involved, and the appearances coincided with the onset of menstruation. In the right eye the hæmorrhage presented the typical shape, and the central scotoma corresponded to this, but inverted, horizontal below with the semi-circular outline above.

With a small retinal hæmorrhage, the prognosis may be grave; with preretinal hæmorrhage, the sparser the amount of blood, the less important the predisposing cause.

The possibility of vicarious menstruation is referred to, but few authentic cases of such in the eye have been reported.

One should be on the look-out for milder cases of preretinal hæmorrhage. By careful ophthalmoscopic search and testing for central scotoma, such cases may be found to occur oftener than suspected.

HENRY L. G. LEASK.

VIII.—BACTERIOLOGY.

- 1 Dutoit.—On streptococcal infection of an eye during scarlet fever. (Ueber Streptokokken Infection des Auges bei Scharlach.) *Zeitschrift für Augenheilkunde*, April, 1908.
- (2) Chesneau.—A note on two cases of primary mycosis of the lacrymal canaliculi. Note sur deux cas de mycose primitive des canalicules lacrymaux.) *Annales d'Oculistique*, décembre, 1908.
- (3) Dernahl, P. H.—On the pathogenic properties of the xerosis bacillus. (Ueber die Pathogenität des Xerosebacillus.) *Arch. für Augenheilkunde*, Dezember, 1908.
- (4) Casella.—A note on traumatic panophthalmitis. Contributo allo studio delle Panoftalmi Traumatiche.) *Revista Ital. di Ottalmologia*, December, 1908.

(1) Dutoit (Burgdorf) introduces us to a very ordinary case in which an eye, after a burn, became infected with strepto- and staphylococci and in which the cornea necrosed and perforated. Some days after the burn, the patient, a child 16 months old, developed scarlatina.

T. HARRISON BUTLER.

(2) Chesneau gives the histories of two cases of obstinate recurring conjunctivitis cured by the removal from the canaliculi (upper in one case and lower in the other, of masses which, on microscopic examination, were found to present the appearances characteristic of actinomycosis. In the second case there was an ulcer of the upper wall of the canaliculus, 3-4mm. in diameter, a complication not previously recorded and probably due to the length of time (4 years) the condition had been allowed to remain untreated.

R. J. COULTER.

(3) Dernahl declares that he has often observed cases of conjunctival catarrh in which the bacillus of xerosis was the only organism present, as shown by the examination of smears and cultures. The condition is generally confined to the palpebral conjunctiva and the lower lid is more affected than the upper one. The vessels are slightly injected; in some cases there is a uniform hyperemia of the conjunctiva. The latter presents a smooth, glistening surface, while the folds of the fornix are generally slightly swollen and injected and the caruncle is sometimes affected in the same way. There is some lacrymation, the secretion consisting of a clear and watery or viscid fluid. The patients complain of a sensation of sand in the eyes and need to rub them frequently in order to see clearly, especially when working by artificial light. There is often a history of dust or some other foreign body having got into the eye two or three days before. The author supports his clinical observations with a number of experiments upon rabbits and patients. He used ascites-bouillon upon which he had grown pure cultures of the organism obtained from various patients and had subsequently sterilized. This he dropped into the eyes for several hours, in some cases scratching the surface of the conjunctiva slightly before instilling the drops so as to imitate the effect of a foreign body. In rabbits he also gave subconjunctival injections of the fluid. He found that the normal healthy conjunctiva did react to the toxin sometimes, and showed injection and chemosis, which, however, passed off in a day or two. When the conjunctiva had been injured, the reaction was more severe and lasted longer. Subconjunctival injections always had some effect, but not a severe one. In the case of patients instillation produced

positive results in three out of twelve cases. The reaction was characterised by injection of the conjunctiva and marked hyperæmia of the lower fornix. The caruncle was deep-red and a creamy-yellow secretion collected at the inner angle of the eye. The severity of the reaction seemed to depend upon the length of time with which the toxins had come into contact with the conjunctiva, and upon individual differences in the power of resisting the toxins.

PERCIVAL J. HAY.

(4) **Casella** gives the history of a case in which the exciting micro-organism proved to be the diplobacillus of Morax-Axenfeld. This observation adds another to the list of organisms capable of exciting panophthalmitis.

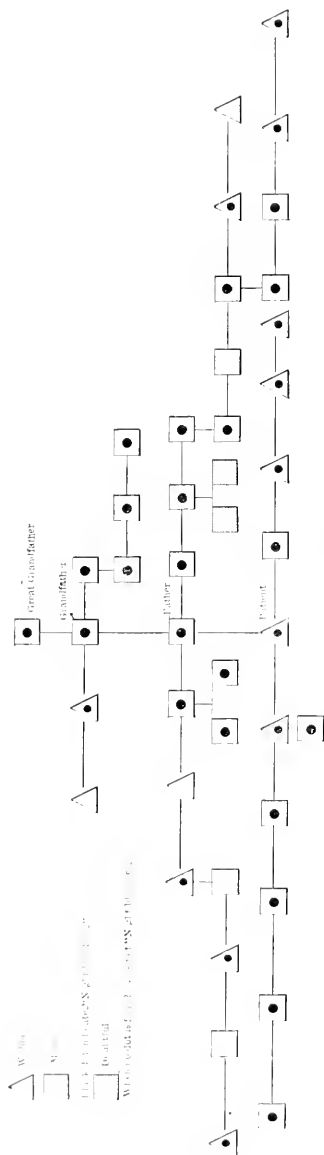
HAROLD GRIMSDALE.

IX.—HEMERALOPIA.

Bordley, James J.—A family of hemeralopes. *Johns Hopkins Hospital Bulletin*, September, 1908.

Bordley (Baltimore) gives a most interesting account of a negro family of night-blind people extending over five generations. All the members of the family were not affected, but every case with demonstrable night-blindness had a hemeralopic parent. There was no record of a normal-sighted member having had any children. Physically, the family was characterized by great strength, but the temporal arteries of even the children were very prominent and the radials quite stiff. In the older members of the family ophthalmoscopic examination showed very pronounced arterio-sclerosis; in the children only were the fundi free from signs of this. The retinæ were free from pigmentary disturbances, nor were there any evidences of antecedent or present inflammations. In good daylight vision was practically normal. None of the family had nystagmus. Seven members of the family of different ages and of different branches of the family were examined perimetrically. In every case there was complete loss out of the outer-lower quadrants of both fields. These scotomata were absolute and did not encroach on the central portions of the fields. With reduction of daylight the (remaining) visual fields became more and more contracted. These people had to cease work at sunset; after nightfall they behaved like ordinary blind persons, losing the power of orientation from enormous contraction of their fields. As they grew older, their visual fields, even in bright daylight, became more and more constricted until finally they became totally blind. Total blindness was looked upon in the family as a sign of death, for shortly after they became blind they died. After blindness came on, the corneæ ulcerated, became infected, and the eyes were lost. In one case "the loss of the eye was due to trouble in the Gasserian ganglion or beyond."

Bordley finishes his most interesting account, which is accompanied by perimetric charts and a family tree (see p. 278) with the following words:—"While I can offer no explanation for the cause of this family ailment, I am convinced that the trouble does not lie alone in the photo-chemical apparatus of the retina. The loss, in every case examined for it, of the outer-lower quadrants of the visual fields, the progressive nature of the disease, the association of blindness



FAMILY TREE OF LEVERHOUSES,

and death, the failure in the only case watched on the part of the trigemini to function properly, to my mind indicates some inherited brain defect of a progressive nature. If we couple with these conditions the fact that the ophthalmoscope revealed nothing abnormal, the evidence is certainly strong against the theory that the family of night-blind people are suffering merely from a lack of visual purple." ERNEST THOMSON.

X.—RUPTURE OF THE EYEBALL IN GLAUCOMA.

- (1) Coppez, H.—On spontaneous ruptures of the eyeball in cases of glaucoma. (*Sur les ruptures spontanées du globe oculaire dans le glaucome.*) *Archives d'Ophthalmologie*, octobre, 1908.
- (2) Villard, H.—Upon spontaneous ruptures of the eyeball in glaucoma. (*Sur les ruptures spontanées du globe oculaire dans le glaucome.*) *Ibidem*, décembre, 1908.

Of rupture of the eyeball in glaucoma, Coppez (Brussels) reports one case and Villard (Montpellier) two cases. Coppez believes that the accident is much rarer now than in the days when the diagnosis and treatment of glaucoma were ill-understood or not understood at all, and in support of his opinion mentions cases reported by Baster (1768), Kyll (1834), Flemming (1858), and Mackenzie (1865). On the other hand, Villard appears to question whether rupture of the eyeball as a mode of termination of glaucoma is so exceptional as Coppez claims.

With regard to mechanism, Coppez sets out to enquire whether the initial event in cases of glaucomatous rupture is a profuse intra-ocular hæmorrhage or a rupture of the cornea. He points out that in most of the published cases ulceration of the cornea preceded rupture of the globe. The corneal changes may be so circumscribed that when rupture takes place, the ulcerated part may disappear carried away in the clot of blood, and what remains of the cornea, being transparent and sound, may convey the false impression of having undergone rupture without any determining lesion. Coppez believes that in some cases the ulcerated cornea becomes ruptured, and that hæmorrhage is determined by the consequent sudden lowering of the intra-ocular tension, a process analogous to that sometimes observed after iridectomy or cataract extraction. In other cases, however, the cornea has lost its resistance, and should the eye become congested by any means whatsoever—as a fit of anger, an effort, or an exaggerated inclination of the head or body—the choroidal vessels rupture, the intra-ocular tension rises abruptly, and the weakened cornea gives way. Villard deals with the mechanism of rupture by simply stating that in his own cases rupture had been preceded by ulceration and consequent enfeeblement of the resistance of the cornea.

A brief account may be given of Coppez's pathological examination of a ruptured globe, secured nine months after the accident had taken place. On opening the eyeball, the interior was found to be largely occupied by yellowish-white tissue, extending from the ora serrata to the papilla, between the sclera and the choroid. The choroid was mostly detached, and crowded towards the centre of the globe. The retina was also detached and convolvulus-like, and in front formed a compact mass with the ciliary body, iris, and cornea. The lens was absent. The corneal and conjunctival epithelium,

covered with disorganized red blood corpuscles, was considerably thickened. The cornea was practically converted into vascular connective tissue, although traces of Descemet's membrane were visible here and there. The choroid, as regards that part left adherent to the sclera, was thickened. Its veins were gaping, recent patches of periphlebitis were present, and the arteries had undergone hyaline degeneration. There were numerous projections from the lamina vitrea. Where the choroid was detached, it could be seen that the yellowish-white tissue, spoken of above, was made up of young connective tissue, with some blood-vessels. It was remarkable that no blood could be found in the eye, despite the fact that nine months before enucleation it had been the seat of a formidable hemorrhage. At the same time Coppez obtained the so-called "Prussian blue reaction" in the epithelium of the ciliary processes and of the ciliary zone of the retina, as well as in the retina and the basal epithelial cells of the conjunctiva and cornea. SYDNEY STEPHENSON.

XI.—THE EARS AND THE EYES.

- (1) Blanco.—The relation between diseases of the auditory apparatus and those of the eye. *Relaciones entre las enfermedades del aparato auditivo y las de la vision.* *Archivos de Oftalmologia Hispano-Americanos*, Nov., 1905.
- (2) Morax.—Choked disc in the intra-cranial complications of auricular affections. (*La névrite œdémateuse dans les complications endocraniennes des affections auriculaires.*) *Ann. d'Oculistique*, T. CXXXVII, p. 375, mai, 1907.
- (3) Sauvinau.—Ocular paralyses and pupillary troubles occurring in affections of the ears, the sinuses, and the teeth, and in the course of broncho-pulmonary and cardio-aortic affections. (*Les paralysies oculaires et les troubles pupillaires dans les affections de l'oreille, des sinus et des dents, et au cours des affections broncho-pulmonaires et cardio-aortiques.*) *Ann. d'Oculistique*, T. CXXXVIII, p. 321, novembre, 1907.
- (4) Barr, J. Stoddart and Rowan, John.—An investigation into the frequency and significance of optic neuritis and other vascular changes in the retinae of patients suffering from purulent disease of the middle ear, with the results of the examination of the eyes and ears in 100 consecutive cases. *British Medical Journal*, November 23rd, 1907.
- (5) Baldenweck.—On alterations in the Gasserian ganglion and the sixth pair occurring in the course of inflammation of the middle ear. (*Les altérations du ganglion de Gasser et de la sixième paire au cours des inflammations de l'oreille moyenne.*) *Ann. d'Oculistique*, T. CXXXIX, p. 246, avril, 1908.

1 The cases may be divided into two main divisions, those in which some functional disturbance of the eye is associated with disease of some part of the auditory apparatus, and those in which there is definite organic disease of the eye. Both of these classes contain many varieties of disturbance. As a rule, the point of connection between the two systems is the trigeminal

nerve and its multiple nervous anastomoses. There seem to be also connections between the centre of the oculo-motor nerve and that of the auditory by which the reflex movements of the eyes and ears are co-ordinated. By the close nervous communication any disease of the mucous membrane of the middle ear may be complicated by disturbances of the intrinsic or extrinsic ocular muscles.

Nystagmus is one of the commonest ocular signs of ear disease, and is almost always associated with vertigo. The nervous mechanism seems to lie in the connection between the semicircular canals and the oculo-motor nuclei.

In this part of the paper must be mentioned the phenomena of coloured sounds; in certain people sounds are always associated in the mind with colour, and inevitably produce the visual spectrum. These sensations of colour are projected outside the patient and connected in some way with the source of the sound. As a rule, high notes give more definite and marked spectra than low.

In the transmission of organic disease from the ear to the eye, the chief track is by way of the nose. The mucous membrane of the sphenoidal sinus is often in direct contact with the sheaths of the optic nerve in the optic foramen, and this is a track often travelled by inflammation spreading to the optic nerve. There is also continuity between the Eustachian tube and the conjunctiva, by means of the nose and the lacrymal duct.

The most important route is by the meninges; these are often infected from disease of the middle or inner ear, and the infection may spread to the optic or any other nerve which supplies the eye.

The communication ends with a discussion of the various theories of the origin and causation of optic neuritis.

HAROLD GRIMSDALE.

(2) **Morax** Paris gives a detailed clinical and pathological description of a case of choked disc occurring as a complication of suppurative middle ear disease with extra-dural abscess and thrombosis of the lateral sinus but with no meningitis, in which death resulted from secondary abscesses in the lungs. From a study of his own case and of the literature of the subject, he draws the following conclusions: "The choked disc (*névrite adémateuse, Stauungs-Papille*) which occurs at times either with or without functional trouble in patients suffering from chronic otorrhoea with intra-cranial complications is not the result of an extension of the infection to the meninges, but probably depends upon the same pathogenesis as the choked disc of intra-cranial tumours or tubercle, and indicates an internal hydrocephalus. Its presence does not seem to modify the prognosis, which is, however, strongly influenced by early and complete operation."

R. J. COULTER.

(3) This article is an extract in advance from the seventh volume of the *Encyclopédie française d'ophtalmologie*. It contains an account of what is known about the subject, and does not lend itself to abstraction.

R. J. COULTER.

(4) **Barr** Glasgow and **Rowan** Glasgow have sought to determine (1) whether optic neuritis occurs with any frequency in cases of simple purulent otitis media where there is no evidence of intra-cranial or vascular complication; (2) whether, short of an actual optic neuritis, vascular changes in the fundus of the eye of a less marked character are common in such cases. It is clear that the authors have been considerably hampered as regards the second point by the fundus appearances in ametropic eyes, but, being on their guard, they have done their best to eliminate observational error of this kind. There were, in the 100 cases, 6 which showed vascular changes amounting to pretty well-defined optic neuritis, and 21 showing vascular changes, which, while short of what might be termed optic neuritis,

were not compatible with the normal condition. The enquiry shows that the ear affections associated with these vascular changes in the eye were specially severe and persistent, as shown by their course, compared with others, and that the presence of these vascular changes in the optic discs would seem to give an unfavourable character to the prognosis of middle ear disease. Cases showing such changes in the eye-ground should be watched with a view to an early mastoid operation. In this communication the authors do not discuss the *rationale* of the fundus changes, leaving this and other points for future consideration. Five tabular statements accompany the article.

ERNEST THOMSON.

(5) **Baldenweck** points out that in the course of otitis media, especially when it has been neglected or imperfectly drained, the following complications may occur. I. The Gasserian ganglion may be involved by infection through the air cells, by vascular paths, or by osteitis of the apex of the petrous bone, causing severe continuous pain deeply seated in the orbit, and supra- or infra-orbital neuralgia, with, at times, toothache without local cause, areas of hyperæsthesia or anæsthesia in the regions supplied by the fifth nerve and paralysis or tonic contraction of the masseters. II. The sixth nerve may be paralysed: 1. In the course of an extra-dural abscess from (a) simple compression, (b) neuritis due to infection from the surrounding pus, (c) changes caused by caries of the petrous bone. 2. In the course of a meningitis, sometimes very slight, but accompanied by severe pains of a hemicranial type, or localised in the fronto-parietal region, at times resembling trigeminal neuralgia. 3. Without any evident anatomical cause constituting Gradenigo's syndrome characterised by a) acute otitis media, (b) isolated paralysis or paresis of the sixth nerve on the same side as the otitis, (c) intense and very persistent pain localised in the temporal and parietal region also on the same side as the otitis. III. The Gasserian ganglion and the sixth nerve may be involved simultaneously. The condition has not been thoroughly studied, but the chief distinction between cases of neuralgia and those in which the ganglion is diseased is that in the former the pain occurs in paroxysms while in the latter it is constant.

The chief object of the article under review is to show that the paralysis and pain in the syndrome are not, as has been suggested, of reflex origin, but are due to anatomical changes similar to those already described. The following arguments are advanced in favour of this view.—1. The intimate relation between the sixth nerve and the petrous bone renders the former peculiarly liable to implication in disease of the latter and it has been proved that such implication actually takes place. 2. Cases have been recorded in which typical syndromes rapidly developed diffuse intra-cranial inflammation. 3. The long duration of the paralysis and pain, their slow and gradual disappearance, and their persistence at times after the cure of the otitis are difficult to explain by the reflex theory but agree well with the other. 4. Lesions of the fundus oculi occur in cases without symptoms of meningitis.

R. J. COULTER.

XII.—IONISATION TREATMENT IN OPHTHALMOLOGY.

Wirtz, Rob. — Ionisation treatment in Ophthalmology. (*Die Ionentherapie in der Augenheilkunde.*) *Klin. Monatsbl. f. Augenheilkunde*, November—December, 1908.

Wirtz records in an extensive paper his experiences with the ionisation treatment of eye diseases. The principles involved are the same as in the ionisation treatment of skin and of mucous membranes elsewhere. But pioneer work had to be done before the method became available for ophthalmic practice, on account of the peculiar shape and the delicacy of the constituent parts of the visual organ. Wirtz proceeded to construct three different kinds of electrodes of various sizes for cornea, conjunctiva, and the lid margin. These electrodes carry layers of gauze saturated with medicated solution. They insure an even contact between organ and gauze and protection of the neighbouring tissues from the electric current. Valuable preliminary experience as to maximal doses and the intervals between repeated applications was gathered from experiments on animals. The cornea and conjunctiva of rabbits were subjected to ionising currents of varying strength (1 to 2 milliamperes) for a varying length of time (1 minute to 10 minutes). Speaking generally, chlorine, iodine, and sodium ions were found to be mild, zinc, mercury, and, to a lesser degree, copper ions, powerful agents. Cocaine, a kation, is also active; instilled as a local anaesthetic, it should, for this reason, be washed out again before kations are introduced by electrolysis. Other factors on which the effect of ionisation depends are the size of the electrode, the pressure exerted by it, and the amount of tear-fluid present. From all this it is evident that the best results can be attained only after considerable personal experience. The indifferent electrode is given to the patient, who presses it against his arm. Cocaine is instilled in all cases. If the cornea is to be treated, the patient assumes the recumbent position and an eye speculum is introduced; after each sitting a light bandage is applied for 12 hours. In the treatment of the conjunctiva the sitting posture is preferred and the conjunctival electrode is inserted between the lids.

The following eye-affections were treated:—

1.—Six cases of **corneal ulcer**, some mild, some fairly severe in character. A $\frac{1}{2}$ per cent. solution of sulphate of zinc was the electrolytic substance. One to two sittings, in conjunction with atropine and bandage, effected a speedy cure in all cases.

CASE 1.—Infiltrated superficial disc-shaped ulcer, the size of a lentil, progressive lower margin (Petit's diploclacilli). Small hypopyon. Severe pain. V. 6 60. Two M.-A. for two minutes. One hour later the pain had disappeared. The ulcer looked grayish-white, and was covered with fine detritus. Slight changes in adjoining epithelium. The next day the ulcer much improved; after three further days, complete cure with light-gray facette. V. 6 18.

CASE 2.—Small, round, fairly deep, infiltrated ulcer in the centre of the cornea (pneumococci). Iron splinter removed from the eye three days before. V. 6 30. Two M.-A. for one minute. Pain ceased one hour later. In the end, faint facet. V. 6 10.

CASE 3.—Two days ago injury with piece of coal. Infiltrated pneumococcal ulcer, $1\frac{1}{2}$ mm. in diameter. Progressive lower edge. V. 6 18. Two M.-A. for one minute. Pain ceased after two hours. The next day pupil well dilated, ulcer better. On second day, two fresh infiltrations. Two M.-A. for 15 minutes. Patient discharged three days after second sitting. V. 6 10.

CASE 4.—After injury with piece of coal several days ago, small infiltrated ulcer $2\frac{1}{2} \times 1$ mm. (Petit's diploclacilli). Hypopyon of 1 mm. V. 6 10. Two M.-A. for one minute. Discharged with faint nebula. V. 6 0.

CASE 5.—Two days ago injury with small stone. Ulnes serpens (pneumococci) $2 \times 2\frac{1}{2}$ mm. Hypopyon of 2 mm. V. fingers at 1 metre. Two M.-A. for two minutes. Pain subsided at once. After three days, ulcer clean, hypopyon disappeared. V. 6 60. A week later, eye pale. V. 6 20. In the end faint nebula. V. 6 12.

CASE 6.—Pain in left eye since a week. Infiltrated ulcer, the size of a lentil (diploclacilli) V. 6 12. Two M.-A. for one minute. Two to three hours later pain disappeared. Second day, fresh infiltration. One M.-A. for one minute. Four days later ulcer healed. V. 6 0.

2.—Six cases of **interstitial keratitis**. Iodine— or chlorine—ions were used, sometimes both combined, from 1 per cent. sod. iod. and 0.9 per cent. sod. chlor. solution. Ionisation treatment proved superior to the usual means. The results were better in the specific cases than in those due to tubercle. The ions act as irritants, producing hyperæmia and œdema of the cornea, and

effect a more rapid vascularisation and absorption of the corneal infiltrations. The choice of drug and its dose depend on the stage of the disease and the degree of inflammation present.

CASE 1. Girl, 10 years old, bilateral recurring keratitis, due to congenital syphilis. Had received the usual general and local treatment for over a year. R. the whole cornea opaque, slightly vascularised; ciliary injection; posterior synchia; V. fingers at 5 metres. L. eye less irritated, pupil well dilated, V. 6 60. Iodine-ionisation every second day, two M.A. for two minutes. Atropine. Pronounced irritation lasting for 12 hours, at its height 6 hours after each sitting. After 4 weeks' treatment, both eyes quiet, R.V. 6 15, L.V. 6 12.

CASE 2. Boy, 6 years old. R. beginning, L. old interstitial keratitis (specific). L. cloudy opacities in the whole cornea, very little vascularisation; eye quiet; V. fingers at $1\frac{1}{2}$ to 2 inches. Past treatment consisted in massage with yellow ointment and diionine. Daily chlorine-ionisation two M.A. for two to three minutes from July 6th to September 20th. V. 6 30 to 6 24. R. Moderate ciliary injection up and in, corresponding to a small infiltration in the periphery of the cornea. No vascularisation. Iodine-ionisation every second day, two M.A. for two minutes. Atropine. After eight sittings the treatment interrupted, as pupil did not dilate well. Fresh infiltrations and vascularisation had appeared until then. During the following three days the whole cornea became involved. V. fingers close to the eye (August 7th). 15th August: irritation less; pupil well dilated. Ionisation resumed. 27th August. V. Fingers at 5 metres. 16th September. V. 6/36. 21st September. Eye nearly quiet. V. 6 24. Discharged.

CASE 3. Girl, 16 years old. R. recurring interstitial keratitis due to tubercle. General and local treatment since a year. Moderate ciliary injection. Cornea haze due to fine nodular infiltrations. Slight vascularisation. V. 6 15. Iodine-ionisation two M.A. for two minutes every second day. Atropine. After three weeks eye nearly quiet, V. 6 10; then sudden relapse, two fresh infiltrations, pain, injection. Treatment continued. After two weeks, eye again quiet, vision improved. Five days later, eye again worse; third relapse after two weeks. Chlorine introduced instead of iodine. After nine days, eye quiet, V. 6 10. Later on, no relapse, but occasional ciliary injection. Tuberculin cure proposed.

CASE 4. Man, 25 years old. Bilateral interstitial keratitis due to congenital syphilis. R. began 35 months ago. Cornea completely opaque, slightly vascularised. P.L. Pupil well-dilated. Eye much irritated. Iodine-ionisation every day; two M.A. for two minutes. Vascularisation increases, irritation subsides in course of treatment. After seven weeks, cornea nearly clear, V. 6 36. Combination of chlorine and iodine; eleven days after V. 6 24. L. disease just beginning; small marginal infiltration. Iodine every day; two M.A. for two minutes. After 1 month treatment interrupted on account of severe irritation. New infiltrations have appeared and become vascularised. Disease progresses rapidly. After a week, whole cornea opaque, outer half highly vascularised. Ionisation resumed, but not tolerated; therefore combination of chlorine and iodine. The outer half of cornea becomes clearer, the inner vascularised. After three weeks, patient discharged; eye nearly pale; V. 6 36.

CASE 5.—Incomplete.

CASE 6.—Patient, 12 years of age. Bilateral remnants of keratitis. R. dense central opacity, V. 6 60. L. cloudy opacities; V. 6 24. Treated for several months with yellow ointment and diionine. Chlorine, two to four M.A. for two minutes every second day. After three weeks, V.R. 6/36. V.L. 6 12.

3.—Three cases of **corneal nebulae**. Treatment with yellow ointment and diionine had produced no further improvement. Chlorine was applied from 0.9% salt solution.

CASE 1. Patient, 15 years of age. R. Central diffuse nebula, slightly vascularised. V. 6/60. A current of three M.A. for three minutes was applied in intervals of from 1 to 7 days. Moderate irritation after each sitting. After 8 sittings V. 6 15.

CASE 2. Patient, aged 17. L. Four dense central opacities. No vascularisation. V. 6 60. Two M.A. for two minutes daily. Fairly severe irritation. After 17 sittings V. 6/36. Current increased to three M.A. for three minutes. Ten sittings improved V. 6 24.

CASE 3. Patient, aged 20. Bilateral central nebulae without vascularisation. V.R. 6 36; V.L. 6 60. The eyes were treated in turn with a daily current of two M.A. for two minutes. After three weeks V.R. 6 12, V.L. 6 36.

4.—Two cases of **episcleritis** were cured with chlorine-ionisation after a few sittings.

5.—Some **conjunctival affections** are suitable objects for ionisation treatment. Good results were obtained from the introduction of copper-ions $\frac{1}{2}$ per cent. solution of cupr. sulph. to three M.A. for two to three minutes in two cases of old and six of fresh trachoma. Surgical interference has by no means become superfluous, but it appears that copper ionisation can take the place of the copper stick with great advantage in certain cases. Zinc-ions are strong cauterising agents, and must be used with great care and judgment. Wirtz applied them with success in a variety of chronic

and acute catarrhal conditions. Very striking was their curative effect in a case of sycosis. This suggested the ionisation treatment of blepharitic conditions, a subject on which a special paper is about to be published.

C. MARKUS.

XIII—CATARACT AS A CAUSE OF GLAUCOMA.

- (1) **Isaacs.**—Glaucoma due to swollen senile cataract. (*Glaukom infolge von geblähter Cataracta senilis.*) *Klin. Monatsbl. f. Augenheilkunde*, Juni, 1908.
- (2) **Ischreyt, G.**—Senile cataracts as a cause of glaucoma. (*Ueber Glaucoma in Folge von Cataracta senilis.*) *Arch. f. Augenheilk.*, Bd. LXII, Dezember, 1908.

1) **Isaacs** records the case of a patient, aged 80 years, who had a beginning cataract in the left and acute glaucoma in the right eye. The latter condition was evidently caused by the swelling of a maturing senile cataract, for the lens showed characteristic broad sectors of a mother-of-pearl lustre. The glaucomatous symptoms disappeared with eserine and hot fomentations, and a year later, the eye had all the aspects of an ordinary slightly hypermature cataract, fit for operation.

C. MARKUS.

(2) **Ischreyt** gives particulars of a case of cataract followed by glaucoma. When first seen (March 8th, 1907), the patient, a woman aged 76, had senile cataract in both eyes. On October 2nd, R.V. fingers at 30 c.m., projection good. November 6th, R. absolute glaucoma. November 8th, enucleation. The following were the chief features found on microscopic examination: Thickening of Descemet's membrane near the filtration angle and slight proliferation of the endothelium. Descemet's membrane had a crenated appearance here and the indentations were filled with endothelial cells, some of them containing pigment-granules, shallow anterior chamber, obliteration of the filtration angle, the spaces of Fontana, and Schlemm's canal, displacement anteriorly of the lens, fibroid changes in the ciliary body, no cupping of the disc. The author discusses the microscopical appearances and arrives at the conclusion that the obliteration of the filtration angle was not primary, but secondary to anterior displacement of the lens and that the displacement was caused by swelling of the lens and consequent disproportion between the size of the lens and that of the anterior chamber.

P. J. HAY.

XIV.—METHODS OF EXAMINATION.

- (1) **Pedrazzoli, G.**—Examination of the eye by the most simple means. *La Clinique Ophthalmologique*, 10 avril, 1907.
- (2) **Krusius, Franz.**—The preliminary examination of out-patients. *Die Ophthalmologische Klinik*, Juni, 1907.

1. **Pedrazzoli** gives details of the various uses of palpation, oblique illumination, stenopaic apertures, etc., in the diagnosis of ocular conditions.

ERNEST THOMSON.

2. **Krusius** describes the scheme which has been adopted for the preliminary examination of out-patients at the University Eye Hospital, in Marburg. It does not differ in any essential points from those in vogue at similar institutions. In order to save time and prevent omissions, the particulars of the examination are entered upon printed forms with appropriate headings.

P. J. HAY.

XV.—EXOPHTHALMIC GOITRE.

- 1) de Mets.—Pathogenesis and treatment of exophthalmic goitre. (Pathogénie et traitement du goitre exophtalmique.) *La Clinique Ophthalmologique*, 10 juillet, 1906.
- 2) Boston, L. Napoleon.—A valuable sign in exophthalmic goitre. *New York Medical Journal*, August 17th, 1907.
- 3) Abadie, Charles.—Pathogenesis and treatment of exophthalmic goitre. (Pathogenie et traitement du goitre exophtalmique.) *La Clinique Ophthalmologique*, 10 avril, 1908.
- 4) Blanco.—An unusual case of Basedow's disease. (Caso atipico de enfermedad de Basedow.) *Archiv. de Oftal. Hisp.-Americanos*, January, 1909.

1. This appears to be a kind of discussion between de Mets, Abadie, L. Dor, and Terson père. de Mets holds that the disease is essentially due to intoxication by the product of thyroid gland secretion; he minimises the value of section of the sympathetic, and obtains good results with a serum derived from animals (oxen) deprived of the thyroid, which serum is capable of neutralizing the toxins of hypersecretion of the thyroid. He uses 5 centigrammes per day, administered by the mouth. de Mets has had three successful cases.

Abadie takes the directly opposite view. "*Eh bien ! Je le déclare toute de suite, cette opinion est inacceptable.*" He holds that excitation of the sympathetic is the first cause of exophthalmic goitre and pins his faith to limited resection of the cervical sympathetic, performed with the least possible amount of pulling or general disturbance of the nerve. Too much disturbance thereof, or complete resection, are, Abadie considers, the causes of occasional fatal results. It is to be understood, however, that sympathectomy is an ultimate resort. Abadie, acting according to his theory, first gives a fair trial to vasoconstrictor drugs, and moderators of sympathetic action. Sulphate of quinine and preparations of valernian are his favourites. With these may be associated hydrotherapeutics and electrical treatment of the cervical sympathetic.

Terson père) has obtained good results with salicylate of soda. He does not discuss the pathogenesis of the disease.

ERNEST THOMSON.

(2) Boston's sign consists in (a) arrest of the superior eyelid, (b) spasm of the superior eyelid, and (c) further closure of the lid. These phenomena follow one another in rapid succession as the eye is rotated from above downwards. The spasm takes place after the patient has rotated the eyeball upwards, and then attempts to follow the finger of the operator as it is carried below a level with the chin. The superior lids follow downward with the pupil for a short distance, where it rests for an instant, then displays a slight spasm, with apparent slipping back, after which it continues to follow the pupil for an indefinite distance.

The sign, he says, "is not to be confounded with that portion of Graefe's sign, which points to immobility of the superior eyelid with traction of the lid, which is probably the result of spasm. In Graefe's sign the spasmodic condition of the superior lid is present when the eye is at rest, while in the sign herein described and illustrated, the spasm only takes place as the eye is being rotated from above downwards, and the lid continues to follow the pupil immediately after the spasm."

CHARLES A. OLIVER.

3. Abadie, in a paper at the *Congres de Médecine*, 1907, ably supports the

view that exophthalmic goitre in its origin is due to an abnormal excitation of the medullary centres (in the cervico-dorsal region), whence emanate the vaso-dilator fibres of the sympathetic trunk. There is one symptom which completely upsets the theory that this disease is caused by the thyroid itself, namely, that the exaggeration of carotid pulsation is local, other large arteries not participating. All the large arteries ought to show exaggerated pulsation if the disease were due to excessive thyroid secretion. If thyroid hypersecretion were the fundamental cause, then the tachycardiacal exophthalmos should always vary with the size of the goitre; but this is not the case. In experiments on animals it has been thought that injections of thyroid extract led to Graves' disease, but, in reality, there was reproduced only the thyroïdal intoxication which comes on at a given time in the evolution of this malady, and which only constitutes its terminal period.

Reviewing the therapeutics, Abadie says that whatever improvement may be due to serum treatment is only palliative and temporary, but that large doses of sulphate of quinine, the vaso-constrictor *par excellence*, have given, in his hands, and in the hands of Lancereaux, Paulesco, and Hachard complete and lasting cures. Preparations of valerian are also useful. If the disease progresses and forces one to operate, then "instead of performing thyroïdectomy, which may lead to tetanus if one touches the parathyroids, to myxedema if it is too complete, to relapses if it is incomplete . . . one should divide the cervical sympathetic. This ought to be done as simply as possible, by avoiding total extirpation of the trunk and its three ganglia which is useless and more dangerous, by taking as much care as possible not to include in the ligatures the nerve filaments emanating from the sympathetic, by avoiding, in a word, irritation in the territory of a nerve trunk which is already in a state of functional hyper-excitability. It is probable that deaths after this operation are to be attributed to operative faults."

The last paragraph in the paper runs thus.—"If, in spite of every argument, some surgeons still prefer to operate on the thyroid, let them at least take the precaution of not including in the arterial ligatures the nerve filaments of the sympathetic, which accompany the arteries. It will certainly save the lives of some of the patients."

ERNEST THOMSON.

(4) In Blanco's case the onset of Basedow's disease was preceded by an attack of paralysis of the third nerve of the left side, the intraocular branch excepted. It is not clear, however, that this was not rather an accident than a part of the disease.

HAROLD GRIMSDALE.

XVI.—NEURALGIC HERPES OF THE CORNEA.

Cabannes, C.—On neuralgic herpes of the Cornea. *Sur l'herpès névralgique de la Cornée.* *La Clinique Ophthalmologique*, 25 novembre, 1908.

Having had occasion to treat a case of neuralgic herpes cornea—a rare affection—Cabannes has gone over the literature of the subject, and has been able in a very useful way to draw up statements bearing upon the differential diagnosis of three forms of herpetic corneal eruptions, *viz.*, (1) febrile, (2) neuralgic, (3) zonal, with zona ophthalmica. (1) and (2) are rare, but (3) is so rare that Graefe only saw it four times in 5,000 cases, while de Wecker did not even see one case out of a like number of patients. The following are the differential points between them:

1. *Febrile Herpes Corneæ.*—(a) Similar eruption on lips or about the nose, accompanying a febrile attack or broncho-pulmonary affection. (b) Herpetic eruption is not usually preceded by any noteworthy phenomena. (c) Duration of attack is from two weeks to six months.
- (2) *Neuralgic Herpes Corneæ.*—(a) Is preceded by violent neuralgia in the distribution of the ophthalmic division for from twelve to twenty-four hours before the corneal eruption. (b) As soon as the corneal eruption appears the neuralgia disappears. (c) Cure takes two to four days at the most. The diagnosis in the neuralgic period of (2) is difficult. One must have in mind: (1) a corneal or conjunctival foreign body; (2) contusions of the cornea, a nail scratch, etc.; (3) commencing iritis.
3. *Zona Ophthalmia.*—(a) Erysipelas-like redness of the skin, in the region of the distribution of the ophthalmic division. (b) Vesiculation on the erythematous zone. The cornea may show one or two vesicles. (c) The regions affected, even the conjunctiva and cornea, are hypoæsthetic or anæsthetic. (d) The skin cicatrices are persistent and for long anæsthetic, while the vesicles of (1) and (2) leave no trace.

The best treatment of neuralgic herpes corneæ consists in hot compresses and atropine. The full account of Cabannes's case will interest those who may meet with instances of this apparently rare condition. ERNEST THOMSON.

XVII.—TWO UNUSUAL FORMS OF AMBLYOPIA.

McMillan, Lewis.—Two unusual forms of amblyopia. *Ophthalmic Review*, September, 1907.

McMillan's first patient was a man, aged 49, who is reported as suffering from cocaine amblyopia. He noticed his sight for near and distance failing almost suddenly after the use of cocaine and stovaine, used as local anæsthetics before cauterising the nasal mucous membrane. Four operations were performed during two months, and for three of them 75 per cent. solution of cocaine, and for one 20 per cent. stovaine was employed. In spite of the anæsthetic, the operation caused considerable pain; he staggered as if drunk afterwards, and on each occasion vomited on the way home. He had heart disease, and his general health was bad. He was practically a teetotaller, but smoked two to three ounces of "brown twist" in a week. The fields for white were not contracted, but he had central colour scotoma, R.V. 5/60, L.V. 5/24. We are not told anything about his near vision. The discs were pale, and he had about 1D. of H. He was given iodide and strychnine; tobacco was prohibited; and glasses of +2.5 were given, presumably for near work. He left off his tobacco for six months, and then carried on with 1½ oz. per week. Despite this, his vision in a year's time was R. and L. 5/6. In spite of the case being precisely similar to one of tobacco amblyopia, the author thinks it was really due to cocaine. He does not say if he thinks the stovaine was equally prejudicial with the cocaine. Further evidence would be required to convince most people that tobacco was not the beginning and end of this man's eye trouble.

McMillan's second case was one of lightning amblyopia. The patient was a woman, aged 23, who sat at a window for two hours watching a severe thunderstorm. The following day the eyes were painful and the vision defective. When seen, five days after the storm, the right eye was found to be amblyopic from childhood, when she had a squint, and now its vision was

1/50. L.V. hand-movements. The right eye could be slightly improved by correcting its refractive error, but the left showed no improvement with glasses. Treatment consisted of dark glasses, and iodide and strychnine internally. The left disc was blurred and the veins engorged. In two months' time, the left eye saw 5/5, and this was still present a year later. The right eye never improved above 5/30, which was probably what it had before the attack.

C. DEVERLUX MARSHALL.

XVIII.—REMEDIES.

- (1) Fisher, J. Herbert.—A case of chiasma lesion which improved under the administration of thyroid extract. *Ophthalmic Review*, April, 1908.
- (2) Lagrange, F.—On the treatment of ocular tuberculosis. *L'Ophthalmologie Provinciale*, août, 1908.
- (3) Fridenberg, Percy.—Blood-letting in diseases of the eye. *Dietetic and Hygienic Gazette*, November, 1908.
- (4) Marquez.—The treatment of corneal opacities due to silver salts by hyposulphite of soda. *Arch. de Optal. Hisp.-Amer.*, Décembre, 1908.
- (5) Ewing, A. E.—Pain of acute glaucoma relieved by cocain applied to Meckel's ganglion. *American Journal of Ophthalmology*, December, 1908.
- (6) Terlinck, H.—Two grave cases of gonorrhœal ophthalmia cured by lenicet. (Deux cas graves d'ophtalmie blennorragique guéris par le lenicet.) *La Clinique*, décembre, 1908.
- (7) Zimmermann.—New contribution to the paraspecific serum therapy of eye affections. (Nouvelle contribution à la sérothérapie paraspécifique des affections oculaires.) *La Clinique Ophthalmologique*, 10 janvier, 1909.
- (8) Darier.—Guaiacol and ocular tuberculous affections. (Guaiacol et tuberculoses oculaires.) *La Clinique Ophthalmologique*, 10 janvier, 1909.
- (9) Lawrie, W. Duncan.—Treatment of ophthalmia neonatorum. *British Medical Journal*, March 6th, 1909.
- (10) Bronner, Adolph.—Iridectomy in cases of acute iritis in which the pupil cannot be dilated. *Trans. Ophthal. Society U.K.*, Vol. XXIX, 1909, Fasc. 1, p. 81.

(1) Fisher (London) first of all refers to a case of acromegaly in a young man, aged 23, which was reported by Richardson Cross in *Bram*, Vol. XXV, Pt. 2, p. 341. This patient was under observation for five years, and greatly improved while taking extract of thyroid, thymus, and pituitary body.

Fisher's own case was in a man, aged 26, whose sight had been failing for two years, and at last became so bad that it prevented his working as a labourer. He first lost the sight on the left side and later on, the right side failed. He

had suffered from headache. There was no sign of acromegaly. R.V. $\frac{1}{2}$ partly and L.V. no P.L. There was atrophy of both discs; the left pupil re-acted indirectly only. The field of the right eye was a typically hemianopic one. There was no evidence of general nerve disease, and all the organs were healthy. He was put on thyroid extract, gr. v. twice a day, and this has been carried on with a few intervals ever since. After 8 months the right field was only slightly contracted on the temporal side, and the vision was $\frac{1}{2}$ partly. There was no improvement in the atrophic appearance of the disc, and the left eye remained completely blind. He was examined again nearly two years after the last observations were made, and the left eye had V. just P.L.; the right V. was $\frac{1}{2}$ almost fully, and the field was much as it was before. His headaches had disappeared. He was able to work as a labourer. The patient has never shown any sign of myxœdema.

C. DEVEREUX MARSHALL.

(2) **Lagrange** (Bordeaux) discusses the question whether tuberculous eyes should be removed, and gives brief notices of 8 cases from his own practice. He concludes that when the ocular tubercle is apparently primary, and all sight is lost, enucleation should be performed if the lesions are intra-ocular, and destruction with the thermo-cautery is indicated if perforation has taken place; but that if even perception of light is left, the eye should not be removed, while in cases which are obviously secondary to general tuberculosis, operation is only allowable for the relief of pain.

R. J. COULTER.

(4) Silver-opacities of the cornea are usually regarded as incurable. **Marquez** had occasion to treat such a case in a woman of 25 years, who had suffered from trachoma for many years, and had recently, as the result of surgical interference, obtained silver-opacities of both corneæ, while vision, good heretofore, had been almost completely abolished. Marquez determined to attempt to dissolve the albuminate of silver. Rejecting sal ammoniac on account of its irritating qualities, and cyanide of potassium because of its toxicity, he selected hyposulphite of soda. The method of procedure was first to instil a strong solution of cocain; then, to scrape the surface of the cornea gently, so as to loosen the epithelium; and, lastly, to bathe the eye with a large quantity of 5 per cent. solution of the salt. At the end of a quarter of an hour, it was evident that the opacity had diminished greatly.

The baths were given frequently, and the vision improved; each bath was preceded by the instillation of cocain, in the hope of softening the epithelium and thereby allowing the easier passage of the hyposulphite solution.

HAROLD GRIMSDALE.

5 **Ewing**, acting upon the experience of Greenfield Sluder, who had relieved a number of cases of obscure headache by placing a 20 per cent. cocain solution in the nasal fossa over the sphenopalatine ganglion, has tried this treatment in acute glaucoma. The patient, in the throes of a left-sided glaucomatous attack, had eserine instilled, and was sent to Sluder, who found the region of the nose on the left side, adjacent to Meckel's ganglion, decidedly inflamed and swollen. Within a few minutes after the application of 50 per cent. cocaine solution, the pain in the eye and temple ceased entirely. Pilocarpine, 0.50 per cent. solution, was ordered. Next morning the glaucomatous condition was very much less marked, and nine days later, the only evidence of the attack was found in the shape of the pupil.

The author leaves us entirely in the dark as to whether, in his opinion, the cocaine or the eserine is to get credit for the alleviation of the glaucomatous symptoms, whether the nasal condition caused the glaucoma, and whether he proposes to operate on the eye. He tells us, however, that there had been

acute glaucoma in the other eye, "the pain of which was only relieved eventually by an iridectomy," and that in the present instance "the inflammation in the nose has subsided under daily applications of formol 1 per cent., the cocaine having been applied only the one time." We think he might have told us more about what is undoubtedly an interesting case, or else have waited to publish it more fully until his opinions had matured.

ERNEST THOMSON.

6) **Terlinck** (Brussels) reports a couple of cases of gonorrhoeal ophthalmia in the adult treated with and cured by lenicet. The first was a bilateral case. To begin with, the usual treatment—silver nitrate, *lavages*, eserine—was applied to the worst eye, while to the other lenicet and *grands lavages* were used every two hours. The second eye improving more rapidly than the other, the lenicet treatment was applied to the latter as well. On the twenty-second day the patient left the hospital. The final result was as follows:—R.V. = 2 $\frac{3}{4}$: L.V. = 1 $\frac{1}{10}$. Macula and posterior synechiae. In the second case, one of bleborrhagia, with chemosis and oedema of the eyelids, 10 per cent. lenicet was applied to the eye at first every three hours, and then every two hours, and boric washes were used. At a later stage silver nitrate 1 per cent. was also applied. The treatment lasted for one month. Terlinck concludes by remarking that lenicet diminishes suppuration rapidly, and has a favourable influence upon the evolution of corneal abscess.

MARCEL DANIS.

7) **Zimmermann** (Gorlitz) has turned his attention from Deutschmann's serum to that of Roux, and has treated, studied, and reported 28 cases, in most of which the serum therapy has either been the only treatment, or has been employed when other treatment has failed. Ten cubic centimetres of Roux antidiphtheritic serum correspond to 2000 units Behring. According to Darier, the effect of injections after the first becomes less and less, and, like Darier, Zimmermann thinks that when, after one or two injections, there is no appreciable improvement, it is useless to continue them. He employs an initial dose of 1500 Behring units, and obtains a cure in most cases with this single dose. While endeavouring to avoid the uncertainty introduced by the employment of other treatment intercurrently, Zimmermann like Darier has found it necessary for the patient's sake to employ the galvano-cautery and paracentesis in very severe corneal ulcerations, as well as serum treatment. It is an unfortunate necessity. It would be tedious to attempt to summarize the details of these 28 cases. The majority of them were severe corneal ulcers, some were traumatic and some post-operative infections; one was a syphilitic iritis which yielded rapidly to serum treatment after mercurials had failed, and one was probably an orbital cellulitis, which yielded to the serum. It will suffice to say that there were only 4 failures out of the 28 cases. Regarding the particular micro-organisms concerned in these cases, the author says:—"Bacteriological investigation practised in the majority of the cases gives no indication as to the specificity of the action of the serum upon this or that microbe in particular." The organisms which occurred most frequently were the pneumococcus and the streptococcus.

ERNEST THOMSON.

8) **Darier** (Paris) has found repeatedly that an acute exacerbation of the eye condition in the course of tuberculin treatment may be subdued by sub-conjunctival injections of guaiacol 0.02 gramme of cacodylate of guaiacol in 1 c.c. of water, without the addition of alcohol. He has, therefore, experimented with the drug in a number of eye conditions, with, as he himself says, a good number of negative results. A study of these cases leads

one to the conclusion that further research is necessary before coming to a conclusion that guaiacol is a specific in tuberculous eye diseases.

ERNEST THOMSON.

9 **Lawrie Oldham** recommends the treatment of ophthalmia neonatorum by: (1) cleanliness, fresh air and light; (2) external canthotomy; (3) argyrol, 25 per cent., one drop every quarter of an hour during the day and once or twice during the night; and (4) removal of discharge from the eye by means of a weak antiseptic solution, such as potassium permanganate 1 in 10,000.

SYDNEY STEPHENSON.

(10) **Bronner Bradford** advocates iridectomy in cases of acute iritis in which the usual treatment by atropine and so forth fails to dilate the pupil within four or five days, or the aqueous becomes hazy, or there is any increase of tension and much dimness of sight. In atropine dermatitis, too, he finds another indication for the operation. Iridectomy under these circumstances causes decrease of inflammation and reduction of pain, often ruptures recent adhesions, and prevents secondary glaucoma, as well as opacities of the anterior capsule. It also in many cases precludes recurrence. Bronner gives details of six cases which appear to substantiate his views. At the same time, as he points out, it is important not to neglect any underlying constitutional condition, as syphilis or rheumatism.

SYDNEY STEPHENSON.

XIX.—INSTRUMENTS AND APPLIANCES.

- 1 **Maddox, E. E.**—The Prism-Verger: an instrument for the measurement and enlargement of fusion power. *Ophthalmic Review*, April, 1907.
- 2 **Veasey, C. A.**—An instrument for testing the light-reflex of the pupil. *Journ. American Medical Association*, October 19th, 1907.
- 3 **Swasey, Edward.**—A Lid Elevator for cataract operation. *Journ. American Medical Association*, November 16th, 1907.
- 4 **Bordier, H. and Nogier, T.**—A new Pupillometer. *Revue Générale d'Ophthalmologie*, 31 decembre, 1907.
- 5 **Todd, Frank C.**—A simple and effective instrument for cauterizing corneal ulcers. *Ophthalmic Record*, April, 1908.
- 6 **Grossman, Karl.**—An improved form of Artificial Eye. *Ophthalmic Review*, April, 1908.
- 7 **Grossmann, Karl.**—A portable Refractometer and a portable Astigmometer. *Ophthalmic Review*, April, 1908.
- 8 **Daxenberger, F.**—The simplest electrical lamp for ophthalmoscopy. *Wochenschrift für Thier u. Hygiene des Auges*, 4 Juni, 1908.
- 9 **Pyle, Walter L.**—A pocket emergency Ophthalmic Treatment Case. *Journ. American Medical Association*, September 19th, 1908.
- 10 **Bardsley, P. C.**—A new form of Scotometer. *Ophthalmic Review*, November, 1908.
- 11 **Newmayer, S. W.**—An Adjustable Lens for oblique illumination of the eye. *New York Medical Journal*, November 21st, 1908.

- (12) **Ramsay, A. Maitland.**—A spectroscopic test of colour vision. *Trans. Ophthalm. Society U.K.*, Vol. XXIX, 1909, Fasc. 1, p. 1.
- (13) **Smith, Priestley.**—An improved Perimeter. *Ibidem*, p. 52.
- (14) **Harman, N. Bishop.**—A new test for binocular vision: the Diaphragm Test. *Ibidem*, p. 54.

(1) **Maddox's instrument*** is constructed somewhat on the principle of the Stevens' Phorometer, which it slightly resembles, but it differs in purpose. The phorometer measures heterophoria, while this instrument measures vergence power or trains the ocular innervation. It is simple in construction and consists of two prisms of 6° which can be rotated in opposite senses by turning a milled head. It measures both vertical and horizontal vergence. A full description of the method of using the instrument is given in the original paper, which does not lend itself to abstraction. C. DEVEREUX MARSHALL.

(3) To avoid the evil effects of sudden attempts to close an eye while a speculum is in place under the lids, **Swasey** has devised a substitute form of lid elevator. It is so constructed that in place of the ordinary handle it has a small linked chain, which easily moulds itself to the curve, from the eye to a small shallow hook on a silver plate which is attached to a band that passes around the head. After the hook is in place, he has the patient try to blink the eye in order to make sure that it will stay in place. Should the hook come out it is re-introduced, and the lid is lifted one or two links more on the chain, just as much as the patient can stand comfortably. "Under these conditions," he says, "this form of hook has never failed to hold securely." The eyeball is well exposed, and the field of operation unobstructed. Should the patient attempt to close the lids, the force of the pressure is not on the globe, but must be at the point of anchorage—the hook on the head band. CHARLES A. OLIVER.

(4) **Bordier** and **Nogier** have introduced a pupillometer which is free from the disadvantage common to some other instruments of cutting off the illumination of the eye while the pupil is being measured, and thus modifying the size of the pupil. The instrument now being considered consists of two fine polished needles, the one fixed, the other moveable on a scale. A light is placed behind and to the side of the patient's head while the needle points are held close to the eye. The rays of light reflected from the needles form two bands of diffusion circles on the retina. The movable needle is shifted until the patient sees the diffusion circles just touching one another. "All one has to do then is to read the scale in order to obtain the *apparent* diameter of the pupil." ERNEST THOMSON.

(5) **Todd** (Minneapolis) describes and figures the small thermo-cautery commonly known in Great Britain as "Wordsworth's." Two modifications, however, have been made in the instrument. First, the bulb is constructed of copper, and the point of platinum. Secondly, a blunt protuberance comes off from the bulb, and this is intended to be used, when necessary, to cauterize a large area. SYDNEY STEPHENSON.

(6) The improvement suggested by **Grossmann** (Liverpool) is really a modification of the Snellen eye in which there is a protrusion of the upper margin, and this is done to obviate the sunken appearance of the upper lid. He considers the ordinary form of artificial eye most discreditable to anyone who recommends it. C. DEVEREUX MARSHALL.

* See THE OPHTHALMOSCOPIC, 1907, p. 314.

7) The spherical glasses are mounted in two oblong frames, and the lenses are set vertically one above the other. There are 16 in each frame, and they are arranged in double rows, and include all ordinary glasses up to 20 D. The surgeon holds the frames and passes the lenses up and down before the eye on which he is doing retinoscopy.

The astigmometer consists of two frames, arranged as above, containing all the ordinary cylindrical lenses, 36 in number, one contains 18 convex lenses, and the other 18 concave. They are also arranged in two vertical rows. A rod and gearing is attached, so that the axis of the lenses may be rotated as desired. When once the axis has been found, the lenses can be moved up or down until the correct one is found. C. DEVEREUX MARSHALL.

8 **Daxenberger** recommends for ophthalmoscopy a Siemens & Halske 25 candle-power tantalum lamp, with a ground-glass globe. It gives a fairly white illumination and is very good for the different colours of the fundus, as well as those of the mucous membranes. As he has used one for two years, apparently it has not been too strong for his patients; but the reviewer has recently had a case under treatment of relative central scotoma, following the installation of these lamps in the patient's house. The author recommends the lamp for rhinological, laryngological, and otological, as well as ophthalmological examinations, to illuminate test-types, etc.

W. B. INGLIS POLLOCK.

10 **Bardsley's** is an instrument devised for the purpose of detecting very small losses of visual functions, especially in the more central part of the field, such as the island and ring scotomata of chronic glaucoma, retinitis pigmentosa, etc. The central scotomata in disseminated sclerosis, retrobulbar neuritis, and toxic amblyopia, and also, in expert hands, earlier changes than are yet detectable in the functions of the retina in tabes, insular sclerosis, and other diseases. The appliance was fully described in *THE OPHTHALMOSCOPE* of November 1st, 1908. C. DEVEREUX MARSHALL.

11 **Newmayer's** device consists of a lens of the required focal strength, set in a frame fastened to a handle at the end of which there is a ball knob that fits and works in a socket attached to a head band. By placing the band over the head of the patient, who is seated about two feet from the source of illumination, the operator can adjust the lens into any position which is necessary to throw the light where required, and maintain it without assistance. This gives the physician full use of his hands for operating. There are attachments for electrical or candle illumination. The entire apparatus, including the head-band, can be readily taken apart, and folded into a small case. CHARLES A. OLIVER.

BOOK NOTICES.

XI Congresso Internazionale di Oftalmologia. Napoli 2-7 Aprile, 1909. Fascicolo primo. Rome: E. Armani and W. Stein. 1909.

Here we have the first instalment of the communications that will be brought under the notice of the XI International Congress of Ophthalmology at Naples, during the week ended April 7th, 1909. The volume contains fifty-two communications in the four official languages, namely, English, German, French, and Spanish. It is illustrated. The first twenty-four pages contain the official theme for discussion, *viz.*, the standardisation of the notation of visual acuity. Then follow communications, all dealing more or

less with the same subject, by Blanco, Blaauw, Marri, Pergens, and Armaignac. Various questions connected with cataract are treated by Menacho, Verdereaux, Elschmig, Villard, Gidney, and Ortin. Holth writes on his operation of Iridencleisis; and Basso has an article on the question of filtering cicatrix in glaucoma. The visual field is dealt with by A. S. Percival and E. Lopez respectively. Pterygium and pterygium operations are taken up by Ortin and Menacho. Trantas has a couple of articles on exploration of the coats of the eye by means of a simple *loupe*. Wölfflin deals with the interesting question of binocular vision after operations for squint. Landolt takes up the congenial subject of eye instruments. Lucien Howe has a paper on the measurement of the lifting power of the adductors and abductors of the eye. Birch-Hirschfeld treats of the alterations undergone by the conjunctiva in presence of frequent exposure to the various forms of light-rays. Ferentinos describes his experiences with subconjunctival injections in the treatment of post-operative infections. Duane describes a plan for a uniform nomenclature of the motor anomalies of the eye. C. A. Oliver has a paper on the regulation of signalling by colour. There are other communications that need not be more particularly specified.

Bulletin de la Société Belge d'Ophthalmologie. No. 25. Réunion à Bruxelles, le 29 novembre, 1908. Bruxelles: L. Severeyns, 44 Montagne-aux-Herbes-Potageres, 1908.

This slim paper-backed volume of 120 pages contains an account, in abstract, of the meeting of the Belgian Ophthalmological Society, held at Brussels, on November 29th, 1908. A good deal of the space available is taken up with Dr. Paul de Ridder's account of lumbar puncture in affections of the eyes, which was fully noticed in *THE OPHTHALMOSCOPE* of January last (page 58).

Transactions of the Ophthalmological Society of the United Kingdom. Vol. 29. 1909. Fasc. I. London: J. & A. Churchill, 7, Great Marlborough Street. Price 4s. net.

Fasciculus I of Volume XXIX of the *Transactions* of the Ophthalmological Society of the United Kingdom was issued to members on March 8th, 1909—that is to say, when the session of the Society was already upwards of five months old. The belated appearance of the instalment therefore defeats the main object of issuing the *Transactions* in three fasciculi, which was to secure earlier publication than under the old plan of issuing a single volume some three months or so after the session had concluded its sittings. On the other hand, the fasciculus has dropped its inartistic and illegible cover, which is now of a dull-orange hue. As to contents, those suitable will be noticed in due course in the columns of *THE OPHTHALMOSCOPE*. The matter, however, is somewhat exiguous as regards both quantity and quality.

The second Annual Report of the North of England Union of Institutions, Societies, and Agencies for the Blind held at Newcastle-upon-Tyne on Friday, 15th May, 1908. Newcastle-upon-Tyne: R. Ward and Sons, High Bridge. 1908.

This unassuming paper-backed *brochure* of sixty-four pages gives an account of the conference held at Newcastle-upon-Tyne in May 1908, by the North of England Union for the Blind, an association founded in 1906, and

including within its area the six northern counties of England. His Grace the Lord Archbishop of York is President of the Union, the Vice-Presidents of which include such distinguished names as those of the Earls of Derby, Harewood, and Durham.

Dr. George Foggin, in the course of a useful paper on "*The Prevention of Early Blindness*," quotes some recent figures from the Royal Victoria School for the Blind, Newcastle-upon-Tyne, to which he is attached as ophthalmic surgeon. They are as follows: during seven consecutive years, ophthalmia neonatorum accounted for the annexed percentages of the new admissions:—1902, 36.6 per cent.; 1903, 39.1 per cent.; 1904, 37.1 per cent.; 1905, 35.8 per cent.; 1906, 36.4 per cent.; and 1907, 31.6 per cent. The average of these figures was 36.1 per cent. The reason for the continued prevalence of this preventable disease, of course, is to be sought in the fact that precautionary measures, however simple and almost unailing they may be, *are not invariably carried out*. From information derived from the lady health visitors *i.e.*, female sanitary inspectors in Newcastle-upon-Tyne, it appears that in over a series of 1,399 births, only 4 cases of ophthalmia were noted. It would, however, be interesting to know the exact period covered by these figures, and whether still-births were or were not included. Dr. Foggin believes that cases "occur but seldom in the practice of medical men and midwives," and he traces the greatest danger to the so-called "handy woman," by which we suppose he means a lady of uncertain age who enlivens the tedium of "charing" by occasional attendance upon child-bed. At the same time, Dr. Foggin is constrained to admit that cases in the higher classes of life result "from the failure of the medical profession, as a whole, to carry out invariably, as they ought, preventive treatment by the fuller adoption of antiseptic methods in their obstetric work, and by the instillation of silver nitrate drops or drops of a similarly effective character, such as those of protargol." As remedies, Dr. Foggin suggests the notification of all inflammations of the eye which occur during the first fortnight after birth, and the education of the public in the laws of health. In the discussion that followed the reading of Dr. Foggin's paper, the obligatory notification of ophthalmia neonatorum was endorsed by Sir Thomas Oliver and Dr. T. M. Clayton, and condemned by Dr. Nimmo Walker as "an unworkable idea."

An interesting paper "*On Employment for Blind Women*," by Mr. J. Frew Bryden-Glasgow, is also included in the booklet. SYDNEY STEPHENSON.

Contribution à l'Etude du Nystagmus des Mineurs (A contribution to the study of Miners' Nystagmus). Par les Docteurs DRANSART et FAMECHON, Médecins de l'Institut Opthalmologique de Somain (Nord). Extrait du *Bulletin de l'Académie Royale de Médecine de Belgique*, mai-juin, 1908. Bruxelles: Hayez, rue de Louvain, 112. 1908.

This is a report by M. Nuel, the well-known professor of Brussels (who has himself made a study of nystagmus), of a work on that affection, written by MM. Dransart and Famechon. M. Nuel observes that nystagmus is essentially a disease resulting in miners from their occupation, and that in some cases it leads to diminished capacity for work, and occasionally prevents the patient altogether from following his avocation.

The conclusions that may be drawn from the authors' observations are to the following effect:—Wounds and injuries in general, and especially those of the head, intensify the professional nystagmus of miners. Slight injuries of the eye, such as contusions, the entrance of foreign bodies, and wounds of the cornea and of the conjunctiva, frequently lead to an aggravation of manifest nystagmus, or to a transformation of latent into manifest nystagmus. Even an operation

on the eye may have the same effect. In certain cases the nystagmus thus induced is limited to the injured eye, thus causing a clinical form of unilateral nystagmus. Nystagmus retards the process of cicatrisation of wounds of the eye and especially of traumatic ulcer of the cornea. There follows incapacity of work, or rather necessity for rest, which is prolonged beyond all reason, and hence is very prejudicial to the patient, as well as puzzling to the doctor. In the examination of a miner who is suffering from an accident to his eye, a careful look-out should be maintained for the supervention of nystagmus. This is a matter of first-rate importance, for certain manifestations may prove delusive and be erroneously attributed to a different disease, as, for example, chronic glaucoma or traumatic neurosis, which may lead again to responsibilities not justified by the facts of the case. Latent nystagmus, or latent nystagmus in course of development, is seen not unfrequently clinically. This variety, which has been described by one of the authors, has received confirmation by Snell in England and by Reiter and by Romée in Belgium, although Romée has given it another name. Nystagmic blepharospasm is important to be recognised, and should be distinguished from other forms of blepharospasm for which it may be mistaken. The blepharoptosis by which it is generally accompanied, together with the oscillation of the globes, or, in their absence, the special functional troubles associated with nystagmus, will serve to diagnose it and will prevent the blepharospasm from being attributed to a traumatic neurosis.

The nystagmus of miners is frequently accompanied, in its more severe form, if not with true typical amblyopia, with at least a distinct impairment of vision, as a result of torpor of the retina. Accommodative asthenopia is of frequent occurrence, although perhaps in its slightest forms. Nystagmus leads to accidents, lowers the professional value of the miner, and renders him liable to the accidents of his work. The prophylactic treatment of nystagmus should be directed to the improvement of the light in which he works. A better light would abolish two-thirds of all the cases of nystagmus that at present exist, and thus diminish by a noticeable percentage the period of enforced idleness of miners and the number of accidents. Those who have charge of the lamps and explosives, and attend to the escape of inflammable gases, ought to undergo periodical testing of their vision, and should satisfactorily demonstrate that they are free from all tendency to, or loss of vision from, nystagmus.

HENRY POWER.

La Renaissance de l'Ophtalmologie The Revival of Ophthalmology.

By DR. JULIUS HIRSCHBERG, professor of ophthalmology in the University of Berlin. Translated from the German by Dr. Daniël van Duyse, professor of ophthalmology in the University of Ghent. Leipzig: Wilhelm Engelmann. 1908

It is a fortunate circumstance that amidst the anxieties of a busy professional life, men like Professor Hirschberg can still find time to write on the history of ophthalmology. In the present book the Professor, ably translated by his old pupil, Dr. D. van Duyse, of Ghent, traces the history of modern ophthalmology, more especially as it concerns the *renaissance* of the eighteenth century. The volume (dedicated to the Academy of Medicine of Paris) contains an account of cataract and of the operations practised for its removal, together with a description of iridectomy. It is enriched by several excellent reproductions of old plates and prints.

The first observer to establish the actual site of cataract as in the crystalline lens was Werner Rolfinck, of Jena, who confirmed the doctrine of Fr. Quarré, of Paris, by dissecting the eyes of a human subject affected during

life with cataract. In 1706, Brisseau published his famous *Premières Observations sur la Cataracte*, in the course of which he described how he had couched cataract in the eye of a dead soldier, and, on dissection, found that he had, in fact, displaced the opaque lens. This was followed by other communications published in the years 1708 and 1709. But the work of Brisseau, who, although fired with enthusiasm, was young and as yet unknown to fame, attracted no immediate attention. Then, Maître Antoine maintained, as Brisseau had done, that cataract consisted in a hardening of and loss of transparency in the crystalline lens, and this expression of opinion, coming, as it did, from a senior in the profession, attracted the attention of the *Académie Française des Sciences*, and formed the starting-point of a long and acrimonious discussion between anatomists and surgeons. Hirschberg analyses, with conscientious and loving care, the various communications made to the *Académie* on the subject of cataract. Among the bitterest opponents of the novel theory we find the celebrated English oculist, Thomas Woolhouse, at that time resident in Paris. Woolhouse imported into the controversy, not only unscientific warmth, but actual invective as well. Other prominent but less intemperate opponents of the new theory included Jacques Hovius, J. H. Freytag, Philippe Hequet, and names less well-known. Powerful help came from Germany, however, in the shape of a work from the pen of Laurent Heister. After the battle of Oudenarde (1708), Heister had noticed in the hospital at Brussels a grievously wounded soldier lying at the point of death, who suffered from cataract in one of his eyes. After death, Heister found that the crystalline lens of that eye was quite opaque, like a pearl. The new view as to the anatomical seat of cataract was supported by Hermann Boerhaave in Holland, by Valsalva and Morgagni in Italy, by John Taylor and W. Cheselden in England, and Sauveur-François, Morand, Petit, and others in France, where the controversy had been born. But by the commencement of the eighteenth century, thanks to the zeal of Brisseau and the striking demonstration of Maître Antoine, it had received the endorsement of the *Académie*.

A most interesting chapter is devoted to Jacques Daviel, and his discovery of the way of extracting cataract. Daviel was born at La Barre, not far from Rouen, on August 11th, 1696, where his father was the village notary. The text of his various communications on cataract is given by Professor Hirschberg, including his chief mémoire (*Sur une Nouvelle Méthode de Guérir la Cataracte par l'Extraction du Cristallin*), which was published in the 11 volume of *Transactions of the Académie Royale de Chirurgie de Paris*, 1752. Ten years after the appearance of this memorable communication, Daviel died at Geneva, whence he had gone to consult the illustrious Tronchin, from paralysis of the larynx. At his own request, he was interred in French soil at Sacconex, not far from Geneva.

The chapter devoted to the operation for artificial pupil is of particular interest to Englishmen, since to an English surgeon, William Cheselden, surgeon to St. Thomas's Hospital, London, we are indebted for the operation. Cheselden's brief but important communication was published in the XXXV volume of the *Philosophical Transactions* (1727 and 1728), and this was followed by a further account of the operation in the fourth edition of the author's *Anatomy* (1730). In cases of occlusion of the pupil, whether congenital or inflammatory in origin, Cheselden penetrated the sclera behind the plane of the iris with a small cutting-needle, pierced the latter, and divided the iris while withdrawing the instrument from the eye. A rough kind of speculum was used to keep the lids open during the performance of the operation. Sharp (1769), Cheselden's pupil, modified his master's operation

by penetrating the cornea instead of the sclera. Another step forward was that of the Wenzels, father and son, who excised with scissors a flap of iris cut with the knife. Their operation, indeed, formed a transition, as it were, from incision to excision of the iris. The operation of iridectomy, as it is now performed, is due to the imagination of Joseph Beer, of Vienna, and its numerous indications were worked out by Desmarres, A. von Graefe, and their pupils.

SYDNEY STEPHENSON.

CORRESPONDENCE.

THE ARTIFICIAL SPECTRUM TOP.

To the Editor of THE OPHTHALMOSCOPE.

SIR,

I was not present when Mr. A. S. Percival read his paper before the Ophthalmological Society on January 28th. The explanation of the colours of the spectrum top has been attempted by many physiologists, and nearly every one has given a different explanation, at the same time showing that previous views were incorrect. All, however, have adopted the same theory! None of the explanations is consistent with the facts. The points to be specially noted are that the red colour is seen on a surface corresponding to a portion of the retina which has not itself been exposed to light, that is, on the black lines immediately following the black half of the disc. The blue colour is seen on the white ground immediately outside the black lines, and the portion of the retina on which the image falls has just been receiving white light.

The explanation of the phenomenon seems to me as follows—When the image of a black surface or object falls upon the retina the visual purple accumulates and becomes in excess of that in the surrounding parts of the retina which are exposed to light. This part of the retina is therefore partially adapted to darkness, and is accordingly more sensitive to green light. When the image of the white portion of the disc falls upon the eye, the visual purple is diffused beyond the limits of the image, and invades the black line and now appears red through contrast, the white really being pale-green. This greenish tint of the white portion of the disc appears to have been entirely overlooked, but it is quite easy to see, especially if another piece of white paper be used for the purpose of comparison. When the image of the black line falls upon a portion of the retina which has been previously exposed to light, the diffusion of the visual purple is stopped at that part, and so the adjacent white portion appears bluish-green or blue through contrast. Now the conditions are most favourable for contrast, the inducing colour being weak and covering a relatively large surface to that on which the contrast colour is seen. The after-image of a black object is green, as the reader can easily ascertain for himself by looking for some seconds at a black object and then at a white surface, as, for instance, snow. How can this be explained on any of the former theories? I, at first, thought that this green after-image was caused by red light (invisible to the eye) reflected from the black object, but I obtain the same result with a hole in a sphere placed so that no light could be reflected from the interior. When the retina has been exposed to light, it becomes relatively more sensitive to the red end of the spectrum.

I am, Sir,

Faithfully yours,

E. W. EDRIDGE-GREEN.

HENDON GROVE, HENDON.
March 13th, 1900.

AMALGAMATION.

To the Editor of THE OPHTHALMOSCOPE.

SIR,

At the special meeting of the Ophthalmological Society to consider the question of amalgamation with the Royal Society of Medicine, I was much struck by the moderation and earnestness of those who advocated such a course, but although I could not see that there was any ground for extinction of the Ophthalmological Society, except from the point of view of the Royal Society of Medicine, yet from their standpoint there appeared to be a very strong case. Ophthalmology touches nearly every branch of medicine and surgery, and the incompleteness of the Royal Society of Medicine without an ophthalmological section is apparent. That they could form a successful ophthalmological section is clear, and I suppose I may fairly put their reasons for not doing so as twofold: 1. consideration for the Ophthalmological Society; and 2. a hope that by absorption of the Ophthalmological Society their section would be the more successful.

Now many of us, and more especially the non-metropolitan members, honestly think that, though individual ophthalmic surgeons may perhaps gain, ophthalmology will certainly suffer from such amalgamation. It has been said that the chief arguments against it are sentimental, but even if that be so, there is believed to be a very practical reality behind them. Now the majority of what I may call the active workers in a society or section of this kind, are the younger men, those who, to use a popular expression, have "axes to grind," or, in other words, legitimately to advertise the work they are doing to their medical brethren; and the advantage of having the experience and help of senior men to leaven the excessive optimism of new ideas is very great, and it is feared, and I believe rightly feared, that the senior men will not feel the same responsibility for the work and the workers of a section of the Royal Society of Medicine, as they would for their own Society.

Surely, we have here all the elements for a compromise which will give the Royal Society of Medicine all it wants and yet preserve the identity of the Ophthalmological Society. I suggest here the outline of such a scheme, not necessarily the best, but one that could be modified in any direction.

I suggest that the Royal Society of Medicine should form an ophthalmological section and that the Ophthalmological Society shall remain constituted as it is at present, but in future that the Ophthalmological Society shall hold by themselves two meetings only in addition to the Bowman lecture, one in London and one in Ireland, Scotland, or the provinces, and at these meetings, perhaps, the larger questions might be discussed. That the rest of the meetings should be held as joint meetings with the ophthalmological section of the Royal Society of Medicine, such meetings as are now from time to time held. The *personel* of the committee of the ophthalmological section could be the same as that of the Ophthalmological Society; the chairman of the one could also be elected president of the other, or they could be quite different, the chairman taking the chair one joint meeting and the president at another. There need be no rule; each would be constituted separately, and experience could show what was practically the most convenient course to follow. As to the *Transactions*, the ophthalmological section could issue their proceedings in the usual way to their members, but might arrange to supply, at little more than the cost price of actual printing and paper, the number required for the members of the Ophthalmological Society, and these could be greatly amplified with the Bowman lecture and other material which need not

necessarily have been read before the Society, and a large number of illustrations and coloured plates could be added, thereby greatly improving the *Transactions*, which could be published as the "Transactions of the Ophthalmological Society of the United Kingdom with which is incorporated the Reports of the Ophthalmological Section of the Royal Society of Medicine."

The funds set free by the generous action of the Royal Society of Medicine as regards a great deal of the printing and some of the illustrations would enable the Ophthalmological Society to do this in a much better way than heretofore.

As regards the library, the Royal Society might undertake to house the books and in return have the use of them for their own members.

I do not think that there need be any fear that men would join the Ophthalmological Society merely to gain the advantages accruing from association with the ophthalmic section of the Royal Society of Medicine, for the great majority of those to whom the Royal Society of Medicine could be of use would join it, if they have not already do so. Colonial and a great many provincial men who merely get the advantage of the *Transactions* would probably join the Ophthalmological Society only.

There might, too, be considered reasonable grounds for remitting the entrance fee on joining the Ophthalmological Society to those who were already members of the Royal Society of Medicine.

This is a mere sketch of what might be arranged. It is, however, sufficient to show that there is room for both Societies to prosper and dwell together in unity for the common good of ophthalmology.

Yours, etc.,

ROBERT W. DOYNE.

30, CAVENDISH SQUARE, LONDON, W.
March 15th, 1900.

PROFESSOR AXENFELD'S

"LEHRBUCH DER AUGENHEILKUNDE."

To the Editor of THE OPHTHALMOSCOPE.

SIR,

My attention has been called to some points in my review of Axenfeld's *Lehrbuch der Augenheilkunde* in your February issue, which require amendment or explanation. Through a slip, Professor Heine was represented as suggesting tenotomy of the internal rectus in myopia; the treatment was that of "a tendency to divergence" in myopia, and the suggestion was "tenotomy of the *external* rectus (one or both), or, better still, advancement of the internal rectus." I quite overlooked the parenthetical clause regarding keratitis punctata superficialis, which occurs in the description of keratitis eczematosa, and is indexed keratitis subepithelialis punctata. I would like to withdraw the remarks "there is not a word about it," and "without an attempt at their diagnosis," in reference to diseases of the corneal epithelium.

In the preliminary precautions in cataract extraction, although a bacteriological examination is not actually mentioned, a note (see p. 7) refers to the chapter on examination of the eye, where on p. 13 this precaution is clearly stated.

I regret that on these points I have not done justice to the authors of the various chapters. I have had the opportunity of seeing some of the originals of the plates, and it is the printer, not the artist, who is responsible for the impression they gave. Prof. Elschnig's originals are very fine. It is only fair to the producers of the book to say that the illustrations are very numerous, and that the technical defects in some of them are more noticeable in contrast with the extreme excellence of others. Constant reference for a period of some three months has proved the work of great interest, and found the index very valuable.

Yours, &c.,

THE REVIEWER.

NOTES AND ECHOES.

Deaths.

GEORGE EDWARD WALKER, the founder of St. Paul's Eye and Ear Hospital, Liverpool, died, aged 69 years, on February 15th last, at Las Palmas, Grand Canary.

He was born at Wigan, and received his medical education at University College Hospital, London. He was clinical assistant to Sir William Bowman, at the Moorfields Hospital, London. In the year 1870 Walker settled as a general surgeon in Liverpool, and whilst awaiting practice, he started a dispensary in St. Paul's Square for the free treatment of the poor affected with diseases of the eye or ear. The work increased rapidly, and from the two small rooms in which Walker started his free dispensary, grew the present hospital, which contains 50 beds and treats about 10,000 patients every year. Walker's principal publication was *Essays in Ophthalmology*, issued in the year 1870. This book contained papers on "Glaucoma," "Exophthalmos," "Gonorrhoeal Ophthalmia," "Neuro-Retinal Atrophy," and "Sympathetic Ophthalmia." Perhaps no better index to the character of the man can be found than the preface of his modest volume. It ran as follows:—"As I am quite unknown beyond the confines of a limited circle, I feel some diffidence in publishing these essays, most of which contain theory and practice different from what obtains in the profession. But as scarcely a day passes without giving an illustration of the truth of some statement contained therein, and since I have been encouraged by the cautious approval of two gentlemen of repute in ophthalmology, I venture to bring these Essays before the profession, in the sure hope that they may be fairly considered and fairly judged." Mr. Walker once held the appointment of ophthalmic surgeon to the Royal Albert Edward Infirmary, Wigan, and at the time of his death he was consulting ophthalmic surgeon to the Liverpool Northern Hospital, and honorary surgeon to the School for the Indigent Blind, Liverpool. He was devoted to his work, and except for brief holidays, for thirty-nine years he visited St. Paul's Hospital daily, until ill-health compelled him to go abroad. He had hoped to die in harness, and even on the day of departure to Las Palmas he saw patients. Mr. Walker leaves a widow and six children to mourn his decease. One of

his sons, Dr. A. Nimmo Walker, holds the post of surgeon to the Hospital founded by his father.

Thomas Evans, a widely-known ophthalmic surgeon of Sydney, died in January last, at the age of 59 years. He helped to found the Ophthalmic Institution in connection with the Sydney Hospital.

The deaths are also announced of Dr. Joseph W. Jewett, at New Haven, at the age of 54 years, and of Dr. C. M. Swartz, of Pueblo, Colo., at the age of 32 years.



The late Mr. G. E. WALKER.

We regret to announce the death, from a tram accident, at Munich, on March 2nd, at the age of 72 years, of Dr. Karl Seggel, a well-known military and ophthalmic surgeon. He had written much on errors of refraction and visual acuity. To him is due the credit of the inauguration of the Eye Klinik for Army Surgeons. Dr. N. Prawossud, *privatdozent* of ophthalmology in Moscow, is also dead.

Privatdozent Dr. Krauss, of Marburg, has had the title of professor bestowed upon him, and a like honour has fallen upon *Privatdozent* W. Stock, of Freiburg, and Dr. Pröbstung, of Cologne. Dr. Troitsky, of Charkow, has been nominated professor of ophthalmology. Bietti, Padova, has been appointed extraordinary professor of ophthalmology in the University of Cagliari. Lodata (Siena) has been nominated professor in the University of Palermo. Dr. Schleich, professor of ophthalmology, has been appointed Rector of the University of Tübingen for the session 1909-1910.

N. B. Harman has been appointed assistant ophthalmic surgeon to the West London Hospital and lecturer in ophthalmology to the Post-Graduate College. F. Hewkley has been appointed ophthalmic surgeon to the Western General Dispensary, London, N.W. J. Wishart Kerr and J. King Patrick have been appointed honorary anaesthetists to the Glasgow Eye Infirmary. Ernest A. Boxer has been appointed honorary electrician to the same institution. Charles Goulden has been appointed ophthalmic surgeon to the Oldham Infirmary. R. A. Morrell has been appointed ophthalmic house surgeon to St. Thomas's Hospital, London.

* * * *

A special meeting of the Ophthalmological Society of the United Kingdom was held at 11, Chandos Street, W., on March 12th, for the purpose of considering amalgamation between the Society, on the one hand, and the Royal Society of Medicine, on the other. Mr. Priestley Smith presided. The meeting room was full to repletion, many well-known provincial members of the Society being present. The following resolution was moved by Dr. George Mackay and seconded by Mr. E. Nettleship:—"That this meeting, specially convened to consider the question, is of opinion that amalgamation of the Ophthalmological Society of the United Kingdom with the Royal Society of Medicine is desirable, and hereby authorises the steps necessary to such amalgamation being taken in due course." An amendment, namely, to take a *plebiscite* on the subject, was proposed by Sir Anderson Critchett and seconded by Sir Henry Swanzy. Amid a scene of some little excitement, very foreign to the usual somnolent atmosphere of the Ophthalmological Society, the amendment was carried by 53 to 41 votes. Five members known to be in sympathy with the movement for amalgamation and five opposed to it, together with the President of the Society as chairman, were appointed to draw up statements *pro* and *contra* with a view to circulation among the members of the Society, resident and non-resident. The meeting, which lasted for three hours, was characterized by a good deal of discursive speaking.

Below we give a copy of the anonymous "whip" which excited heated comments from both sides of the house. This mischievous document was distributed to many of the Metropolitan members of the Society. Speculation is still rife as to the name of its author:—

"OPHTHALMOLOGICAL SOCIETY OF THE UNITED KINGDOM."

—

"As there is reason to believe that country members of this Society, to whom the proposed amalgamation can make little or no

difference, are organising a strong opposition, it is earnestly to be hoped that all members of the Society resident in London and district, who have much to gain by the proposed amalgamation, will make a point of being present at the meeting on Friday, and record their votes in favour of the change."

* * * *

Professor
Schmidt-Rimpler.

PROFESSOR HERMANN SCHMIDT-RIMPLER attained his seventieth birthday on December 30th, 1908. Hearty congratulations!

* * * *

Miners' Nystagmus.

THE serenity of the last meeting of the Belgian Ophthalmological Society was somewhat ruffled by a breeze which centred around the subject of miners' nystagmus. It arose thuswise. Romée, of Liège, complained of a statement attributed to Nuel, who was reported to have said that the photographs of coal-winners published by Nieden, Simeon Snell, Dransart, and Romée were "faked." After some more or less acrimonious discussion, the matter was laid to rest, let us hope finally, by Nuel substituting the word "*arrangé*" for "*truqué*," employed in his original criticism.

* * * *

Benefactions.

MRS. NOSWORTHY, of Dawlish, has contributed £1,000 to the funds of the West of England Eye Infirmary, at Exeter. The Central London Ophthalmic Hospital has received a donation of £10 10s. from the Cutlers' Company, as well as a present of game from the King.

* * * *

London County Council
and the
Royal Eye Hospital.

AT a recent meeting of the Education Committee of the London County Council a communication was submitted by the Day Schools Sub-Committee from Mr. M. MacHardy, on behalf of the Royal Eye Hospital, Southwark, calling the attention of the Council to the extensive provision made at the hospital for the treatment of children attending the public elementary schools on the south side of the Thames, and suggesting that the efforts of the hospital to provide a "model department" should be subsidized from the rates. On the proposition of the Rev. Stewart Headlam, it was agreed to inform Mr. MacHardy that it was hoped that an additional Parliamentary grant would

be obtained from the Government in respect of the new powers conferred by Section 18 of the Education (Administrative Provisions) Act, 1907, but that for the present the Education Committee was unable to decide as to the amount of medical treatment to be undertaken. This is all very well; but what puzzles one is why Mr. MacHardy, instead of the secretary, should always voice the public affairs of this hospital, to which he is attached as senior surgeon. The official named is surely the right and proper person to represent the institution when its affairs are likely to be brought prominently under public notice in the columns of the lay press, as in the present instance.

* * * *

THE appended advertisement, one of a most objectionable kind, is being distributed very liberally in the south-western districts of London. It raises questions as to the position of the ophthalmic surgeon mentioned, and as to his precise relationship to the firm of Ernest & Company. The announcement appears to call for the close and immediate attention both of the British Medical Association and of the General Medical Council. Have we here an example of the offence known technically as "covering"?

* * *

ERNEST & CO.,

Make such arrangements that persons
have their vision tested by an
Ophthalmic Surgeon attached to a
recognised Hospital, and spectacles
supplied from **21 - inclusive.**

**ALBION HOUSE,
59-61, New Oxford Street,
LONDON, W.C.**

* * * *

Among the names of medical colleagues who perished in the Messina earthquakes we fail to find that of a single ophthalmic surgeon. Best congratulations to Professors Scimemi, Tornatola, Palermo, D'Alessandro, and Musumeci upon having escaped the holocaust.

* * *

A Diploma in Ophthalmology.

MARCH 9th last saw the inauguration of a movement that may be fraught with far-reaching consequences as regards ophthalmology. On that date Convocation of the University of Oxford sanctioned the granting of a Diploma of Ophthalmology. Details of the scheme, so far as they are yet arranged, will be found on p. 251 of the present number of THE OPHTHALMOSCOPE.

* * * *

Ophthalmia neonatorum

IT may not be generally known that as a result of a conference held in 1908 between representatives of the Manchester Royal Eye Hospital and the Manchester Midwives Supervising Medical Sub-Committee the hospital authorities undertook to notify to the Sub-Committee all cases of ophthalmia neonatorum brought to the Hospital for treatment. Much might be done in the battle against ophthalmia if eye hospitals would notify such cases to the proper quarter and would make a point of reporting any midwife who failed to call in a medical man or, worse still, attempted herself to treat any instance of inflamed eyes in babies. The enlightened action of the Manchester Royal Eye Hospital raises anew the question whether ophthalmic hospitals generally are doing all that can be done for the prevention and treatment of cases of infantile ophthalmia. Ophthalmic surgeons have always been the foremost to advocate prevention of the disease, although that is clearly a question with which the obstetrician is much more intimately concerned. Some hospitals—as, for example, the Sheffield Royal Infirmary—have for years issued cautionary notices regarding the dangers of the disease. The Bradford Royal Eye and Ear Hospital has gone a step further, and caused such notices to be distributed once a year to every woman whose name is on the official roll of midwives for the district. At the Moorfields Hospital, London, an attempt has been made to place the more severe cases of the disease, treated as outpatients, under the care of the Queen's Jubilee nurses, who receive elementary instruction in ophthalmic nursing at the hospital. At Moorfields, too, the third house-surgeon is specially charged with the treatment of the cases of ophthalmia neonatorum and trachoma. What are the remaining institutions doing? Does the "policy of the paint-brush" still dominate the hospital treatment of this disastrous disease?

* * * *

Ophthalmia at Hanley, Staffs.

At a conference of public representatives, held on March 4th, at Hanley, Staffs, Mr. Herbert H. Folker submitted a scheme for dealing with ophthalmia neonatorum, and in doing so, pointed out that the cost of educating a blind child from the age of 5 to 13 years amounted to the sum of £300 against £40 for a seeing child during the same period. Mr. Folker's scheme is outlined below:

- (1) Compulsory notification of all cases of ophthalmia occurring in new-born infants.

2) As soon as a case is reported, the Medical Officer of Health, or in his absence, any medical practitioner to be summoned to visit the case, to verify or otherwise, for which a fee is to be paid.

3) A small house suitably furnished for the reception of mother and child, and staffed with trained nurses to be provided.

4) If after the visit of the medical man the case proves to be one of ophthalmia, the mother and child to be removed at once in the ambulance to the home.

5) If the mother is being attended by a doctor, he would still attend his patient at the home.

6) Where a patient is in a position to pay, a charge to be made towards her maintenance and the treatment of the child.

7) The cost of the home and the provision and maintenance of the nurses to be paid out of the rates.

THE OPHTHALMOSCOPE.

A MONTHLY REVIEW OF CURRENT OPHTHALMOLOGY.

VOL. VII. No. 5.]

MAY 1, 1909.

TWO SHILLINGS.

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ORIGINAL COMMUNICATIONS.

THE EXTRACTION OF PARTICLES OF METAL FROM THE
INTERIOR OF THE EYE:

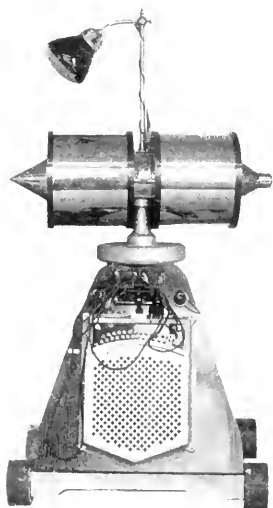
A CLINICAL STUDY OF FIFTY CASES.

BY

JOHN WHARTON, M.A., M.D. (CANTAB.),

HONORARY ASSISTANT SURGEON, ROYAL EYE HOSPITAL, MANCHESTER.

IN recent years a considerable amount of literature has been published concerning the comparative value of the small and large magnets for the removal of metal chippings from the interior of the eye, and seeing that, even at the present time, considerable diversity of opinion exists, I take this



opportunity of presenting to the readers of THE OPHTHALMOSCOPE the results which I have obtained in fifty consecutive operations upon patients at the Manchester Royal Eye Hospital. Of the eyes saved, all were examined at a period ranging between eight months and four-and-a-half years from the date of the accident. Previous to September, 1903, the magnet in use at the Hospital was the small hand electro-magnet of Hirschberg. We then obtained the large modified Haab's electro-magnet. In all the operations one or other or both magnets were used.

The large magnet, a photograph of which accompanies this article, was made by Messrs. John Hunter & Co., of Liverpool, and consists of a core of annealed soft iron which is encircled by two wire coils. The coils are

wound to carry a current obtained from the main, of 6 amperes, but, by means of a resistance situated at the side of the stand, the strength of this current can be reduced from six to three amperes and consequently the pull of the magnet can be varied at will.

With a current of six amperes passing through the coils the magnet can exert a pull of 30 lbs. per square inch sectional area, when the object which is being attracted is at a distance of one inch from the magnet point.

The magnet is mounted upon a stand which permits of free movement of the former in a horizontal plane. The total weight of the magnet and stand is 6 cwts.

In the following tables 1 give a short account of each case.

The patients, all males, were, as a rule, of excellent bodily health, and were workers in the local engineering shops.

Of the 50 eyes operated upon, 33 were saved (66 per cent.), and 17 lost (34 per cent.)

In 20 cases the right eye was affected, the left eye in 30 cases.

In analysing the cases it is convenient to consider them under the following headings.

(A) The situation of the wound of entry.

In 37 eyes the wound was in the cornea.

" 10 " " " " " ciliary region.

" 3 " " " " " " sclera.

The influence which the site of the injury has upon the ultimate result in any given case is of great importance.

(a) *Corneal wounds*.—Undoubtedly the most favourable class of case is that in which the piece of metal, having passed through the cornea, comes to rest somewhere in the eye anterior to the suspensory ligament of the lens or its posterior capsule.

In every case 1 met with of this description (12 in number) the eye was saved and the resulting vision excellent.

In 7 eyes the vision = $\frac{6}{6}$ (one case had hypopyon at time of operation.)

" 2 " " " $\frac{6}{6}$

" 3 " " " $\frac{6}{12}$ (one case had hypopyon at time of operation.)

Total 12

On the other hand, the cases in which the metal passes through the cornea and ultimately rests in the vitreous chamber are of serious moment. Especially is this the case when the lens is, in addition, injured, for a severe irido-cyclitis usually develops.

In my series there were 25 eye injuries in which the metal had passed through the cornea into the vitreous chamber and of these 14 eyes were saved and 11 lost. Of the 14 eyes saved—

6 had a resulting vision of $\frac{6}{18}$ or better.

4 " " J.20

4 " " Fingers, shadows, or perception of light.

Total 14

Of the 11 eyes lost—

9 were lost from plastic irido-cyclitis.

1 was " purulent choroiditis,

1 " " panophthalmitis.

Total 11

Out of 37 corneal injuries, in only four was there any prolapse of iris and in two of these the iris did not present beyond the anterior corneal surface.

The absence of iris prolapse in a case of complete corneal wound is, in my opinion, a strong point in favour of a foreign body having passed into the eye and either resting in the eye or beyond it.

(b) *Wounds involving the ciliary region.*—In ciliary body injuries, more than in any other region, early operation is of great importance. This enables one to remove the metal before the wound has become sealed up, and also permits of effective measures being taken against sepsis. Meridional wounds give a better prognosis than oblique or equatorial injuries. Provided that the wounds remain aseptic, I do not think these ciliary zone injuries are any more serious than the corneal lesions, in which the metal has passed into the vitreous chamber.

I operated upon ten cases with the following results:—

5 eyes were saved.

In 3 cases the V. = $\frac{6}{12}$ or better.

" 2 " " V. = Fingers or shadows.

Total 5

5 eyes were lost.

In 3 cases from plastic irido-cyclitis.

" 1 " " purulent choroiditis.

" 1 " " panophthalmitis.

Total 5

(c) *Scleral wounds.*—In scleral wounds, also, provided that the injury, even if extensive, is meridional, the wound aseptic, and the operation performed early, the prognosis is as good as that for wounds of the ciliary body. Two of the three eyes with scleral wounds were saved (with V. = J.20 and fingers). The one eye lost was enucleated for plastic irido-cyclitis. In this case the piece of metal which had produced the injury was a scale $\frac{1}{2} \times \frac{1}{4}$ inch in size.

In none of my cases did sympathetic ophthalmitis follow the injury. This was due to the early enucleation of an eye in which an irido-cyclitis was present with poor vision, a globe tender to pressure, and the tension of the eye showing a tendency to be subnormal. Undoubtedly, in the working man's interests, it is useless to dally with such an eye, in the hope of saving it purely for appearance sake.

B Time intervening between accident and operation.

In every case the operation for removal of the metal was performed as soon as possible after admission to the hospital. Radiograms were obtained in doubtful cases or for purposes of localisation. A foreign body embedded in the eye quickly becomes surrounded by a plastic exudate which, although quite soft, holds it firmly and offers great resistance to its removal. Then, again, in the case of a piece of iron which has lodged in the eye a few days, the attractive force necessary to withdraw the metal drags so much on the tissues in its vicinity that the subsequent inflammatory reaction, coupled with that set up by the original trauma, reduces the possibility of a satisfactory termination, and in some cases produces a severe form of irido-cyclitis with early shrinking of the globe.

So severe is the result of this dragging on the tissues that, in the case of a piece of metal which has been in the eye several weeks, it is inadvisable, in

my opinion, to use the large magnet. This is a question to which I shall refer later in discussing operative measures.

Of the 26 eyes operated upon the same day as accident, 18 were saved, 8 lost.

"	9	"	"	2nd	"	"	6	"	3	"
"	2	"	"	5th to 7th	"	"	2	"		"
"	2	"	"	10th	"	"	1	"	1	"
"	3	"	"	19th day to 5 months	"	"	3	"		"

(C) Operation.

All the operations were performed under cocaine anaesthesia (4 per cent. solution), and great care was taken to avoid sepsis, perchloride of mercury 1 in 5000 being used with that end in view.

The methods adopted were as follows:—

(i) *When the metal had passed through the cornea and was resting on or immediately behind the iris.*—In such cases a limbal corneal section was made near the site of the metal with a Graefe's knife. The armature of the hand magnet was then introduced to the anterior chamber. It was frequently possible to remove the metal without interfering with the iris, but in some cases the latter structure was so adherent to the steel that an iridectomy was necessary.

In a few instances the iris prolapsed through the limbal wound, after the removal of the chip, and necessitated an iridectomy.

(ii) *A corneal wound with the metal chip resting in the lens.*—Here the metal was drawn, by means of the giant magnet, into the anterior chamber, and, if the corneal wound was large enough and recent, through the original wound. When the corneal wound was sealed up, a small limbal section was made and the metal removed from the anterior chamber by the small magnet. The cataract was dealt with later on, when the eye was perfectly quiet.

(iii) *The metal resting in the vitreous chamber.* (a) In recent injuries, with a scleral or ciliary body wound, the metal was withdrawn along its path of entry by means of the giant magnet. In two cases (Nos. 3 and 5) the chip "locked" in the lips of the wound and necessitated an enlargement of the latter. Both cases did well. Previous to the removal of the metal, the conjunctiva was dissected up around the site of the injury, and after the removal, was carefully sutured over the wound.

(b) It is when the wound of entry is corneal and recent and the foreign body rests in the vitreous chamber that the giant magnet is most useful. Under such circumstances, it is necessary for a strong attractive force to be at the surgeon's command. By careful manipulation of the patient's head, it is possible to draw the metal through the lens, if the latter has been injured by the accident, or through the circumferential space into the anterior chamber, whence removal is easy.

It is extremely difficult to draw the metal through the circumferential space, and then through the pupil into the anterior chamber. In my experience, the metal has usually become entangled in the iris tissue and has necessitated a limbal section with iridectomy before its removal could be effected. It is important, at the end of the operation, to get the iris quite free from the corneal wound. Occasionally the giant magnet has no influence on the metal at first, even though the strongest power is used. In such cases I have found a sudden "making" and "breaking" of the current a great aid.

The smallest chippings are the most difficult to remove. The force at hand, as supplied by the giant magnet, must be very carefully regulated, for in one case (No. 49), even though the patient's eye was more than one foot from the magnet point, yet the whole of the iris was torn from its base and slipped

through the corneal wound attached to the metal. In one case (No. 31) the giant magnet was applied twice. At the first operation a piece of metal, 1 mm. long, was removed and this was thought to be all the metal, as the magnet was working some time. Three days later "a glistening object" was observed in the vitreous chamber, and this, when removed, proved to be a piece of metal 5 mm. in length.

(c) When the metal has been in the eye several days, the influence of the giant magnet is far less than in recent cases, and though it is always advisable to give the instrument a patient trial, I have found that in two cases (Nos. 34 and 36) it failed to draw the metal into the anterior chamber. In such cases the metal, if not visible through the pupil, was localised by Davidson's apparatus. I next dissected the conjunctiva off the sclerotic at a site nearest the foreign body, made a meridional scleral incision about 4 mm. in length, and then, either by again applying the large magnet (No. 3), or by introducing the armature of the small magnet into the lips of the scleral wound (Nos. 34 and 36), the metal was removed. I never found it necessary to probe about in the vitreous chamber with the small magnet armature whilst searching for the metal.

In three cases (Nos. 20, 25, 26) the metal, after being drawn into the anterior chamber, was removed from the latter by means of iris forceps.

In one case (No. 39) the piece of metal, being non-magnetic, was removed from the lens with forceps. To do this, a limbal corneal section with iridectomy was necessary.

The presence of hypopyon is no bar, in my opinion, to the immediate performance of the operation (Nos. 15 and 19). In one case (No. 15) there was intense inflammatory reaction after the operation, and this I treated with subconjunctival injections of cyanide of mercury and aconit, hot fomentations, and atropine; the resulting vision was $\frac{6}{6}$ partly.

(D) The size and shape of the piece of metal.

Metal chippings may be classified as spicules, scales, and "chunks." The spicules were easiest to remove, and did least damage to the eye. On the other hand, the scales, especially when large, caused the most damage. They produced large, jagged, external wounds, and their removal lacerated the intra-ocular tissues. The "chunks" usually came to rest in the anterior portion of the eyeball.

(E) Results.

The number of cases operated upon was 50, and of these 33 eyes were saved (66 per cent.) and 17 (34 per cent.) lost.

Of the eyes saved, the following visual results were obtained:—

In 9 cases the resulting vision was				
" 4	"	"	"	$\frac{6}{6}$
" 6	"	"	"	$\frac{6}{6}$
" 2	"	"	"	$\frac{9}{9}$
" 5	"	"	"	$\frac{12}{12}$
" 3	"	"	"	$\frac{18}{18}$
" 3	"	"	"	J, 20
" 1	"	"	"	fingers
" 1	"	"	"	shadows
" 1	"	"	"	P.L.

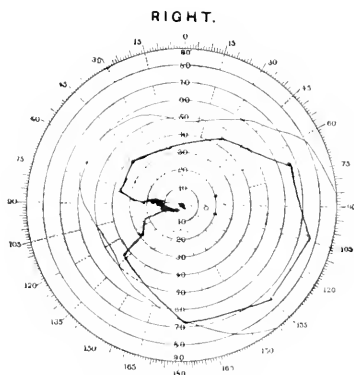
Total ... 33

All the eyes were examined at least eight months after the accident. Detachment of the retina was observed in 5 eyes (Nos. 7, 21, 35, 42, 44)

and in all these cases the giant magnet had been employed to remove the piece of metal.

Case No. 14 was interesting from the fact that the metal, triangular in shape, was seen suspended by its apex, from the inner side of the optic disc. Three years after the operation, the eye was examined, and a small scar was observed at the inner side of the disc. The vitreous was quite clear.

This absence of opacity in the vitreous was also noted in two other cases (Nos. 6 and 40) in which the piece of metal had rested in the coats of the eye in the vicinity of the macula. The choroido-retinal scar in one case (No. 6) influenced the field of vision, as shown in the accompanying chart.



No.	Eye	Nature of Injury.	Vision before Operation.	Interval between accident and operation.	Operation.	Result.	State of eye when last seen (noting time elapsed since accident).
1	R	Punctured wound through centre of upper lid and ciliary body immediately behind. Faint vitreous haze above F.B.* as a black point in ciliary wound	$\frac{1}{16}$ J. I.	1 day	F.B. (spicule) $\frac{3}{4}$ inch long withdrawn from ciliary wound by G.M.* Conjunctiva sutured over wound	$\frac{1}{16}$ J. I. to	4 $\frac{1}{2}$ years. Streaky vitreous opacity above, F.N.* Field good.
2	L.	Clean cut wound of corneal limbus down and out, also of iris immediately behind. In the iris is visible a scale-like F.B., which, from its position, must have involved the lens. No reflex	Shadows	Same day	F.B. withdrawn by G.M. Trideotomy to free the wound	$\frac{1}{16}$ J. I.	4 years.

*F.B. Foreign body. G.M. Giant magnet. S.M.—Small magnet. F.N. = Fundus normal.

No.	Eye	Nature of Injury	Vision before Operation	Interval from accident to Operation	Operation	Result	State of eye when last seen (noting time elapsed since accident)
3	R.	Small healed scar in cornea (lower $\frac{1}{2}$) with hole in iris behind. Diffuse floating vitreous opacities. No fundus details. Radiogram positive.	Shadows	25 days	G.M. no result. Then puncture in sclera down and in (as far back as possible). Again no result with G.M. though the wound "pointed" evidently F.B. locked. Wound enlarged at right angles to first incision (which was meridional). Scale-like F.B. 5mm. long with jagged edges withdrawn. Conjunctiva sutured over wound.	J 20	35 years. Large floating vitreous opacities. No fundus details. Tn. eye quiet
4	L.	Small wound of corneal limbus at inner side with prolapse of iris. Hyphema $\frac{1}{2}$. No reflex.	P.L.	Same day	F.B. removed by G.M. Irdecotomy	Lost	Eye on examination showed purulent choroiditis. Eye was enucleated two months after accident
5	R.	Clean cut at outer side, in the ciliary body. Wound about 3mm. long and horizontal in direction. Good A.C. Some recent hemorrhage in vitreous behind site of injury, and in which a small lustrous body can be seen. F.B. Tn.	Fingers	Same day	Patient applied to G.M. Some bulging of wound. Wound enlarged and later at right angles to the original wound F.B. a chunk 3mm. in diameter, was then withdrawn by G.M. conjunctiva sutured over wound	$\frac{1}{12}$ J1	32 years. F.N. Field good. Vitreous quite clear
6	R.	Wound of corneal limbus in upper and outer quadrant. Hole in iris behind (and near its base). Good A.C. Trace of hyphema. Lens clear, dull reflex, no F.B. to be seen. Tn. Radiogram showed F.B. in back in eye situated about posterior pole of the eye and resting in the coat of the eye.	Shadows	Same day	Patient applied to Giant Magnet. Iris observed to bulge forward up and out. Irdecotomy up and out. F.B. (chunk) 3 mm. long removed by G.M.	J 20	34 years. Fundus examination showed choroidal atrophy 2 disc diameters vertically and one horizontally at macula T.N. Media clear; no sign of retinal detachment. Nasal field deficient
7	L.	Cut in wound of ciliary body (near limbus) at outer side and in cornea in front. No reflex.	Shadows	Same day	Spicule of steel 8mm. long removed by G.M. Conjunctiva sutured over wound	Fingers	32 years. Eye quiet. F.N. Periphery of retina detached all round
8	L.	Wound in cornea a little below center. Shallow corneal indentation and trace of hyphema. Tn. Tn. partially opaque. No reflex. Tn.	Shadows	2 days	F.B. drawn into A.C. by G.M. section below F.B. removed	Lost	The eye remained quiet for 3 months, then cyclitis T = 2. No P.L. Enucleation

No.	Eye	Nature of Injury.	Vision before Operation	Interval from accident to Operation	Operation.	Result.	State of eye when last seen (noting time elapsed since accident).
9	L.	Vertical wound of cornea (4 mm. long) just to outer side of centre. Iris cut through also immediately behind corneal wound. Lens opaque. F. B. Radiogram showed F.B. in vitreous.	Shadows	1 day	F.B. removed through Tenon's and corneal wound by G.M.	Lost	Three months after accident eye was emulsified for cyclitis.
10	R.	Small oblique wound in cornea just above centre. Penetrating lens, through the iris, is a rod shaped F.B. The anterior end of the rod is in the A.C., near the posterior corneal surface. No reflex. Tn.	Shadows	1 day	F.B. removed by G.M.	$\frac{1}{2}$ Ji	A second operation for the cataract was performed 3 weeks after the accident. The eye was quiet and V. $\frac{6}{6}$ Ji 3 years later.
11	R.	Wound at outer side of cornea; hole in iris behind corneal wound. Hyphema. F.—1	P.L.	same day	F.B. drawn to iris at inner side by G.M. Section up and in. Iridectomy. F.B. withdrawn by G.M.	$\frac{6}{6}$ Ji	Three years.
12	R.	Small spicule of steel in iris up and in. Corneal wound up and in. The F.B. was evidently mostly in the posterior chamber, as it could be seen round the pupillary margin and it bulged the iris forward somewhat.	$\frac{1}{2}$ Ji	One day	Section above. Iridectomy. F.B. withdrawn (as it was resting on the anterior lens capsule) by the small magnet.	$\frac{1}{2}$ Ji	Seen 3 years after accident. Eye quiet. V. 2. Tn. Small speck of opacity of anterior capsule of lens to the inner side.
13	L.	Small wound of cornea, about 2 mm. long, up and out. Fair A.C. Pupil small. F.B. about 3 mm. by 2 mm., a chunk, embedded in iris behind corneal wound. Tn.	$\frac{1}{2}$ Ji	Same day	Section above. F.B. withdrawn by small magnet. Iridectomy.	$\frac{1}{2}$ Ji	Three years. Eye quiet. F.X.
14	L.	Mentioned, clean cut of conjunctiva and sclera over ciliary body at inner side and 3 mm. from limbus. Pupil medium. Some blood clot in vitreous at inner side, and evidently attached to wound of ciliary body. F.B., scaly and triangular in shape, could be seen, with ophthalmoscope, stuck by its apex to back of eye, just to the inner side of the optic disc.	$\frac{1}{2}$ Ji	Same day	Conjunctiva dissected up around wound in ciliary region. F.B. withdrawn by G.M. Conjunctiva sutured over the wound.	$\frac{1}{2}$ Ji.	3 years: Eye quiet, media clear, field good. Tn. small pigmented scar at inner side of disc. Vitreous quite clear.

No.	Eye	Nature of Injury	Vision before Operation.	Interval from accident to Operation.	Operation.	Result.	State of eye when last seen (noting time elapsed since accident.)
15	L.	Intense injection of eye. Small infiltrated wound of cornea near centre. Trace of hypopyon. Iritis, synech. post. to inner side. Lens opaque. Radiogram positive, showing F.B. behind iris at inner side and about on plane with post lens capsule (by localiser).	Shadows	16 days	There was still a trace of hypopyon at time of operation. F.B. was withdrawn by G.M. into A.C. from behind iris. Section below: hypopyon evacuated, F.B. about 1 mm. in diameter removed by S.M. For a few days after the operation there was intense inflammatory reaction. Subconjunctival injections of cyanide of mercury and acoin were given. Six months later the lens was removed (discission).	$\frac{6}{12}$ iv. Ji	3 years. Eye quiet. F.N. Vitreous clear. The F.B., I think, must have been situated in the posterior chamber.
16	L.	Horizontal wound of cornea to inner side of centre. Shallow A.C. Iris in wound but not prolapsed. F.B. visible through pupil just behind iris at inner side. F.N.	$\frac{6}{24}$ J 16	Same day	F.B. withdrawn by G.M. Iris replaced its pupillary margin intact.	$\frac{6}{12}$ Ji	2½ years. Eye quiet. Pupil active. Field good.
17	R.	Cut lower lid margin at outer side. An irregularly-shaped wound $\frac{1}{2}$ inch long in sclera down and out. Edge of F.B. protrudes. Deep A.C. Pupil medium. No fundus details. T = 2	P.L.	One day	F.B., a scale, $\frac{1}{2}$ inch long by $\frac{1}{4}$ inch broad, removed by G.M. Conjunctiva sutured over wound.	Lost	The eye made an excellent immediate recovery a month after the accident. R.V. = $\frac{6}{9}$. Later there was retinal detachment to inner side. The lens was pulled over to inner side. Marked cyclitis, neuro-retinitis. Emulsification 7 weeks after accident. Eye quiet. 2½ years.
18	L.	Small central wound of cornea. F.B. visible in centre of lens. The latter is slightly opaque. Dull fundus reflex. No details. T =	Fingers	Same day	F.B. withdrawn by G.M. Later, a discission and suction.	$\frac{6}{12}$ Ji.	Eye quiet. 2½ years.
19	L.	Central vertical (1 mm.) infiltrated corneal wound. Iritis. Hypopyon (th. Resting on iris, just below pupil, is a small F.B. partially embedded in lymph T =	P.L.	Same day	Section below. Hypopyon evacuated. F.B. withdrawn by S.M. Iris prolapsed but was replaced.	$\frac{6}{12}$ Ji.	2½ years. Eye quiet. F.N.

No.	Eye	Nature of Injury.	Vision before Operation	Interval from accident to Operation.	Operation	Result	State of eye when last seen noting time elapsed since accident.
20	L.	Oblique jagged corneal wound, involving whole cornea. F.B., a spicule, protruding (about 2 mm.) from lens into A.C. No reflex. T 1	P. L.	Same day	F.B. scale, $\frac{1}{2}$ inch long by 2th broad, withdrawn by G.M., and later by forceps	Lost	Panophthalmitis on 7th day. Eye enucleated 3 months later
21	R	Central horizontal wound of cornea. Horizontal slit in iris just below pupil. Dull fundus reflex. Tn.	Fingers	Same day	G.M. at first had no result. Then section below. Iridectomy. F.B. withdrawn "after a time" by G.M.	Fingers	Eye quiet. Tn. Retinal detachment at inner side, 2½ years.
22	R	Small oblique corneal wound above. Good A.C. Small F.B. (rounded) on iris below. Iritis.	Fingers	One day	Section below. F.B. removed by S.M.	2 h	2 years. Eye quiet. F.N.
23	R.	Wound of ciliary region below: Hole in iris at its base and continuous with the ciliary wound; no fundus reflex. T 1	P.L.	One day	F.B. drawn into A.C. by G.M. section below. Removal of F.B. by S.M.	Lost	Eye lost from Purulent choroiditis
24	L.	Chemosis of conjunctiva. Meridional wound of ciliary region (at outer side) 6 mm. long. Deep A.C. vitreous opacities T 2	Fingers	Same day	F.B. a chunk 5 by 3 mm. removed by G.M. Conjunctiva sutured over wound	Lost	Eye was enucleated 2 months after accident Irido cyclitis
25	L.	Vertical wound of cornea a little to inner side of centre. No A.C. Hole in iris immediately behind corneal wound. Small dark mass (?) Blood (?) F.B. seen through pupil immediately behind iris. Lens opaque at inner side. F.N.	$\frac{6}{23}$ J6	Same day	F.B. drawn into A.C. by G.M. section to inner side. F.B. withdrawn with iris forceps. Iridectomy.	$\frac{6}{23}$ Ji	2 months after the removal of F.B. the lens was removed. Eye seen 2 years after accident F.N. Field good.
26	L.	Small infiltrated punctured wound of cornea above. Good A.C. Small F.B. to be seen in iris above, "evidently end of a spicule as some indurite mass is visible through pupil behind iris."	$\frac{1}{2}$ Ji	Same day	F.B. a spicule 5 mm. long drawn into A.C. by G.M. Section up and in. F.B. withdrawn by forceps. Iridectomy (because F.B. was entangled).	$\frac{6}{23}$ Ji	2 years. F.N. Media clear.
27	R.	Wound of cornea up and out (near limbus) hole in iris immediately behind. Purulent iritis. No fundus reflex. Tn. Trace of hypopyon	P.L.	2 days	F.B. drawn from behind iris, through pupil by G.M. section above. F.B. a chunk 3 by 2 mm. removed by S.M.	Lost	Unimpaired one month after accident to cornea Ido cyclitis

No.	Eye	Nature of Injury	Vision before operation	Interval from accident to operation	Operation	Result.	State of eye when last seen (noting time elapsed since accident).
28	R.	Large cent. centre of upper lid, with a large oblique ciliary body wound above. No fundus reflex. T=3	No P.L.	Same day	F.B. withdrawn by G.M. Conjunctiva sutured over wound; lid wound sutured	Lost	Enucleated (cyclitis) one month after accident
29	L.	Jagged wound of ciliary region below. Hyphema $\frac{1}{2}$. No fundus reflex	P.L. (bare)	Same day	F.B. withdrawn by G.M. Conjunctiva sutured over wound	Lost	Panophthalmitis
30	R.	Wound of cornea to inner side. Shallow A.C. F.B. (a small chunk) resting on iris down and in. I.N., media clear	$\frac{1}{2}$ J 10	Same day	F.B. withdrawn by G.M.	$\frac{1}{2}$ Ji	20 months. Eye quiet. F.N.
31	L.	Small corneal wound limbal below; iris prolapsed. No fundus reflex. Tn.	Shadows	Same day	Small F.B. (a chunk about 1 mm. in diameter) removed by G.M. Tridectomy. 3 days later, eye examined by the ophthalmoscope, large vitreous opacities, together with a "glistening object," in vitreous chamber. G.M. again applied. Another F.B., a spicule 5 mm. long, removed	Lost	Enucleated 5 months after accident for cyclitis.
32	L.	Small central wound of cornea. Shallow A.C. Lens partially opaque. F.B. (by radiogram) in vitreous chamber	Fingers	2 days	F.B. removed by G.M.	Lost	Cyclitis, enucleated one month after accident
33	L.	Small S-shaped wound centre of cornea. Shallow A.C. Pupil medium. Lens partially opaque. F.B. localised far back in vitreous chamber	Shadows	Same day	F.B. (a spicule 4mm. long) drawn into A.C. by G.M. F.B. withdrawn from A.C. by S.M. Tridectomy	Lost	Eye enucleated one month after accident, irido-cyclitis
34	L.	Small wounded cornea a little above and to outer side of centre of cornea. Good A.C. Pupil medium. Post-polar lentil opacity (slight) F.B. localised in vitreous chamber down and out. No fundus details	1/2 20	10 days	G.M. applied to sclera down and out, some pain. Scleral puncture (meridional) down and out. S.M. applied to lips of scleral wound. F.B. 2 mm. long withdrawn. Conjunctiva sutured over wound	$\frac{1}{2}$ Ji.	18 months. Eye quiet. Tn. Few vitreous opacities below. Field good
35	L.	Central wound upper lid. Good A.C. pupil sluggish, wound of ciliary body above (meridional cut), large vitreous opacities, no fundus details. T=1	Shadows	same day	F.B. a scale 4 mm. by 2 mm. withdrawn by G.M. Conjunctiva sutured over scleral wound	Shadows	18 months. Large strand-like vitreous opacities above. Good reflex below. Tn. Eye quiet. Projection bad below

No.	Eye	Nature of Injury	Vision before operation	Interval from accident to operation.	Operation.	Result.	State of eye when last seen (noting time elapsed since accident)
36	L.	Oblique (2 mm) wound of cornea (a little to outer side of centre). Iris. Synech. post. to outer side. Lens opaque. Tn. F.B. localised in vitreous chamber below.	Shadows	7 days	G.M. failed. Scleral puncture down and out (far back). S.M. introduced to lips of wound. F.B. 3 mm long withdrawn. Conjunctiva sutured over scleral wound.	Shadows	18 months. Eye quiet. Lens opaque. Projection good. Tn.
37	L.	Oblique wound, 4 mm. Long, centre of cornea. Iris in wound. Lens opaque. T +1. F.B. localised in vitreous chamber.	P.L.	10 days	F.B. drawn into A.C. by G.M. section below. F.B. removed. Some lens cortex expressed. F.B. was a scale 6 mm. by 5 mm.	Lost	Eye emulsified. Iridocyclitis.
38	L.	Small punctured wound of sclera, about 6 mm from corneal limbus, at outer side. F.B. visible (spicule) in vitreous and running up to scleral wound.	I	10 Same day	F.B. withdrawn by G.M. Conjunctiva sutured over wound.	Fingers	15 months. Eye quiet. Tn. Vitreous opacities to outer side. Central choroidal atrophy (in both eyes).
39	R.	History of patient being struck in eye by piece of "anti-friction metal" (non-magnetic). Vertical wound of cornea below, behind which is a hole in iris and, resting obliquely in the lens, is a scale of metal with its jagged end projecting through anterior lens capsule.	Fingers	Same day	Section below. Iridectomy. F.B. withdrawn with iris forceps. Size of F.B. 5 mm. length. Its deeper extremity was in vitreous chamber.	Lost	Cyclitis.
40	R.	Central punctured wound of upper lid. Jagged wound of sclera 6 mm. behind corneal limbus. Hyphema $\frac{1}{2}$. Tn. F.B. localised far back in vitreous chamber.	Shadows	Same day	F.B. drawn forward by G.M. It did not present in scleral wound, but bulged iris forward above. Iridectomy. F.B. withdrawn by S.M. Later, suction of lens.	J 10	14 months. Aphakia. Capsule. Small scar in choroid, between macula and disc. Media clear. Field good. Vision could be improved by discision.
41	L.	Wound of corneal limbus up and out. F.B. embedded in iris, immediately behind. Lens clear. F.N.	$\frac{6}{10}$ J 4	One day	Section to outer side. F.B. withdrawn by S.M.	$\frac{6}{10}$ J.	14 months. Eye quiet.
42	L.	Muco-purulent conjunctivitis. Oblique wound of cornea upwards and inwards. Lens opaque. Intense iritis. T full.	Shadows	2 days	F.B. withdrawn by G.M. from vitreous chamber.	P.L.	13 months. Capsule in pupil which is drawn upwards and inwards. A.C. deep to outer side. Projection of light had above and to inner side. Eye quiet. Tn.

No.	Eye	Nature of Injury	Vision before Operation	Interval from accident to operation	Operation.	Result.	State of eye when last seen (noting time elapsed since accident).
43	L.	Slight general corneal haze. Small wound of corneal limbus below. F.B. about 2 mm. long (spicule) resting on iris below. Iritis. Dull fundus reflex. Tn.	$\frac{2}{4}$ Jo	One day	Section down and out. F.B. removed by S.M. Iridectomy (iris was prolapsed and could not be replaced).	$\frac{2}{4}$ Ji	13 months. Eye quiet.
44	R.	Scar in cornea to inner side; Lens opaque; Scar in iris at inner side. Projection of light good. F.B. localised 7 mm. behind 7 mm. below of L. 2 mm. inner cornea side.	Shadows	5 months	G.M. Iris bulged forward at inner side. Section down and in. Iridectomy. G.M. removed F.B. 2 mm. long. (Hand magnet (S.M.) failed)	Shadows	13 months. Projection of light had to inner side. Tn. Eye quiet. Pupil closed by tough capsule
45	L.	Fractured wound centre of cornea in lps. of which, and running back through A.C. up to anterior capsule of lens, is a spicule of metal. Iritis. No fundus details. T—1	Fingers	2 days	F.B. removed by G.M.	$\frac{2}{4}$ Ji.	8 months. Eye quiet. F.N.
46	R.	Small wound centre of cornea. Pupil wide; lens partially opaque (chiefly at posterior pole). F.B. visible in centre of lens, about $\frac{2}{3}$ in. away from anterior capsule.	Fingers	5 days	F.B. drawn into A.C. by G.M. Section above; F.B. withdrawn by S.M. Iris entangled. Iridectomy	$\frac{2}{4}$ Ji.	10 months. Eye quiet.
47	L.	Irregular wound centre of cornea. Iritis. Lens opaque T+1. F.B. localised in vitreous chamber.	Shadows	2 days	F.B. drawn by G.M. to iris below. Section below. Iridectomy. F.B. removed by G.M.	J 20	3 years. Some vitreous opacities. Field good. Eye quiet
48	L.	Central corneal wound. Good A.C. Pupil medium. Lens partially opaque. No reflex from fundus. T—1.	Shadows	Same day	F.B. drawn through lens into A.C. by G.M. Section above. F.B. removed by S.M. Iridectomy.	J 18	Eye quiet. Film of capsule in pupil and coloboma. Field good. 9 months.
49	L.	Vertical small wound of cornea below. Lens opaque. T—1	Shadows	2 days	Patient applied to G.M. (about 1 foot off the magnet point). F.B., a chunk about 3 mm. by 2 mm. shot out of wound and carried with it the whole of iris torn from its attachment. Free hæmorrhage into A.C.	Lost	Eye enucleated 3 weeks later. Cyclitis
50	R.	Cut upper lid margin (inner side). Vertical wound of ciliary body to outer side and about 4 mm. in length. Vitreous prolapsed: T—3	Shadows	2 days	F.B. withdrawn by G.M. F.B. a scale 7 mm. by 4 mm.	Lost	Cyclitis

Seventeen eyes were lost—

From plastic irido-cyclitis in 13 cases.

„ purulent choroiditis in 2 „

„ panophthalmitis in 2 „

—
Total 17

It is unnecessary for me to give a summary of the above analysis, believing that it is sufficiently concise, but I would here emphasize one point, namely, the importance of having both magnets at one's command when proceeding to operate. I do not hold with those surgeons who would rely entirely upon the giant magnet. I consider that the small electro-magnet holds a very important place in ophthalmic surgery.

In conclusion, I have to thank Drs. Glascott, Emrys-Jones, and Hill Griffith, my colleagues at the Hospital, for so kindly allowing me to operate upon their cases.

A PIECE OF STEEL EMBEDDED IN THE OPTIC NERVE.

BY

T. HARRISON BUTLER, M.D. Oxon.

HON. OPHTHALMIC SURGEON, COVENTRY AND WARWICKSHIRE HOSPITAL.

H.H., age 23 years, a machinist, came to the Coventry and Warwickshire Hospital on November 25th, 1908, on account of an injury to his eye.



History.—He was attending to a planing machine yesterday when the tool, made of high-speed steel, snapped, and a piece struck his eye. A specimen of the steel was tested, and found to be magnetic. It was almost

certainly very hot, and consequently aseptic, when it entered the eye. The tool has been reconstructed, and no piece is said to be wanting. There is a fragment with a sharp spicule which may have pierced the eye, but not entered it.

Present Condition.—There is a rupture of the sclerotic, about 5 mm. long, at the lower aspect of the left eye, extending slightly into the cornea. There is a linear vertical rent in the anterior capsule, and the lens is cataractous. There is no red reflex. There is no sign of a foreign body in the anterior part of the eye. The globe is moderately injected. Patient is in no pain. There is some iris entangled in the wound. V. no perception of light. There is slight chemosis.

Operation.—The iris was drawn out of the wound, and cut off flush, and the eye well irrigated with 1-5,000 solution of sublimate. A strong hand-magnet, when brought close to the eye, caused no pain whatever. As it was not absolutely certain that the eye contained a foreign body, nothing more was done.

Progress, November 28th.—The eye is quiet and shows no sign of infection. F. normal. V. still no perception of light. Pupil half-dilated with atropine. Less chemosis than yesterday.

November 29th.—The skiagram here reproduced shews a clear shadow of a large foreign body; it also clearly shews the whole eye and the optic nerve. The foreign body appears to lie in the optic nerve itself. The fact that perception of light disappeared at once and has never returned makes its location here almost a certainty.

November 30th.—The lens was evacuated by a linear incision close to the original wound. The long nose-piece of Snell's magnet passed easily along the track of the foreign body, but failed to remove it.

December 2nd.—Mr. J. Jameson Evans very kindly used the Haab giant magnet at the Midland Eye Hospital at Birmingham. There was no reaction whatever.

December 7th.—The eye still remains injected and the iris is becoming discoloured. There is no punctate keratitis or exudate in the pupil, but the iris vessels are congested. Patient consented to have his eye excised, and when the eye was removed, a large piece of steel was found to project from the optic nerve. It was so deeply imbedded that it could not be removed with forceps; the nerve tissue had to be cut away from it. The vitreous was full of blood, and quite disorganised. The piece of steel was pyramidal in shape. It was 6 mm. long, and 3.5 mm. broad. It weighed 0.13 grammes.

Remarks.—The chief interest of the case lies in the fact that the fragment was deeply embedded in the nerve, and in the clear way the final skiagram showed the globe of the eye and the optic nerve. I fancy I can even detect the superior dental nerves. The skiagram, I may add, was taken by the Hospital Dispenser.

ON THE RING MAGNET.

BY

T. HARRISON BUTLER, M.D.



Fig. 1.



Fig. 2.

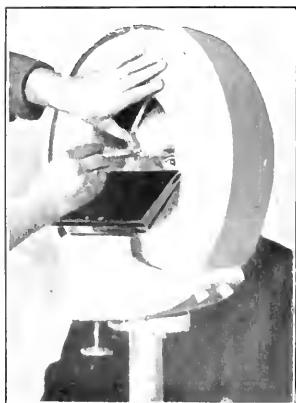


Fig. 3.



Fig. 4.

REVIEW.

ON THE RING MAGNET.

BY

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The magnets usually adopted to remove iron splinters from the eye have a large soft iron core which is surrounded by a bobbin of insulated copper wire. All have a soft iron point where the magnetic field is most saturated. These instruments have great polar magnetic power, but as the lines of force diverge in all directions, the power is concentrated at the immediate pole and falls off very rapidly as the distance increases—in fact, diminishes as the square of the distance. This radiation of the lines of force is well shown in Fig. 1, which shows a bunch of iron filings attached to the pole of an orthodox magnet. This feature diminishes the value of a magnet for extracting deep-seated fragments of iron from the eye, an operation beyond the power of even a powerful hand magnet, unless its tip be actually introduced into the organ. To obtain a sufficiently saturated magnetic field, giant magnets are used, those of Haab, Volkmann, and Schösser being the best-known. Professor Mellinger (1), of Basle, has met the difficulty in a more scientific way. It is well-known that when an electric current flows round a solenoid, a homogenous magnetic field is generated, whose greatest saturation lies at the centre of the axis of the solenoid. The lines of force lie parallel and do not radiate away as with the ordinary magnet. In consequence, the tractive force at the centre of the solenoid is very great along a line at right angles to the plane of the ring. Outside this line the magnetic field is weak, and this peculiarity, as we shall see later, gives rise to the chief objection to the magnet. Fig. 2, which shows graphically the distribution of the lines of force, should be compared with Fig. 1.

The magnet, which is made by Klingelfuss, of Basle, Switzerland, and is sold in England by Messrs. Weiss for about £24, consists of an oval ring surrounded by a large number of windings of copper wire of 1 mm. diameter (Figs. 3 and 4). This solenoid is covered by an insulating mass and enclosed in an iron case, which increases the strength of the magnetic field. In contradistinction to the Haab type, there is no central core of soft iron.

If the patient's head be placed inside the oval ring, as in Fig. 3, his eyes will be in a saturated magnetic field, and any magnetizable body they may contain will exhibit magnetic polarity. If now an iron rod be brought near the centre of the solenoid, it also will be powerfully magnetized. In consequence, the iron splinter will be powerfully attracted to the rod. Soft iron rods of different sizes and a massive iron horn, shown in Fig. 4, are supplied with the apparatus, a rheostat is provided to vary the density of the current. A small rod is first used; it is held like a pencil and approached to the eye. If the force be insufficient, a larger rod is selected and the current increased. If the fragment be very deeply seated and firmly fixed, the iron horn can be used to loosen it. The instrument can be adopted to a voltage of from 100 to 250. If the installation be alternating, a "booster" or rotatory transformer is necessary to rectify it. Fluid rectifiers are on the market, but I am assured by a practical electrician, whom I have consulted on the subject, that they are thoroughly unreliable.

The advantages of the ring magnet are many. It is cheaper and more portable than the giant magnets. The patient can be fixed in an easy posture in a good light, and the operation performed with a light and handy iron rod. The force of the attraction can be varied to any desired degree.

The disadvantages of the magnet have been pointed out by Professor Schirmer (2), of Strasburg. He has had the advantage of working with three varieties of giant magnet; with Schössers at Griefswald, with Volkmann's at Kiel, and he now has a ring magnet in his clinic at Strasburg. He finds that the ring magnet will not attract a piece of iron which lies in the lower half of the globe, because the field of the magnet is confined to a small plane at right angles to the plane of the ring. The eye must be so placed that the line joining the anterior chamber and the splinter is horizontal, a condition which cannot always be attained. Another disadvantage lies in its extraordinary power. Schirmer has seen a fragment drawn right through the intact lens; but the operator must have been at fault, for the rheostat gives perfect control of the power. Schirmer has extracted a large number of foreign bodies with the ring magnet, but he prefers Volkmann's, which hangs over the patient as he lies on the table in a convenient position to have the splinter removed by a corneal section.

Junitzschek (3) describes the ring magnet fully, and compares it with other types of large magnet.

Amberg (4) an assistant in the Basle clinic, has published an account of sixteen cases in which the ring magnet successfully extracted pieces of iron from the eye, seven of which were in the posterior part of the globe. His communication has already been abstracted in this journal.

In England, the magnet has been adopted at Newcastle-on-Tyne. Mr. A. S. Percival (5) finds that it must be used with care, that it affords an excellent view of the field of operation, that it has a wide range of tractive force, and that any one instrument can be used to extract the fragment. The chief objection, he thinks, is that, as the patient must be sitting up, chloroform cannot be given, an objection that applies equally to Haab's giant magnet, unless this be specially slung for use above a supine patient, as it is in the Kiel Naval Hospital. Percival stated that one patient fainted from the pain of the extraction. He has removed with ease from two eyes an iron flake the size of a finger nail which had lodged in the vitreous, with apparently little damage to the eye. One of these patients subsequently suffered from a detached retina, but retained the eye. In the second case, the eye became septic, and was excised. Foreign bodies in the retina, with one exception, have been followed by detachment after extraction. Percival finds that little difficulty is experienced in extracting the fragment, but in those cases where the hand-magnet would not have done equally well, the retina has generally become detached within 6-9 months.

Percival thinks this magnet is very useful, and probably easier to use than giant magnets, but the results are not so much better than those obtained with a hand-magnet, 5 inches long, as he had hoped. This view coincides with another personal communication I received from a surgeon to a large provincial eye hospital, who writes: "Our results since we installed a Haab are no better, taken as a whole, than those which we obtained with Snell's hand-magnet." On the other hand, Goulden (6) has published a long list of good results obtained with the giant magnet at Moorfields Hospital. Only four of the number are recorded with subsequent detachment.

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CLINICAL MEMORANDUM.

A CASE OF HYSTERICAL HEMIANOPSIA AND AMBLYOPIA
IN A BOY OF TWELVE YEARS.

BY

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Introduction.

Among physicians it has been, and still is, somewhat of a moot point whether hemianopsia can be of a purely hysterical or functional nature.

Although cases had been reported by Briquet,¹ Svyenos,² Bellouard,³ Bonnefoy,⁴ Galezowski,⁵ Rosenthal,⁶ and W. A. Sturge,⁷ yet after the appearance of the works of Féré,⁸ and especially of Gilles de la Tourette,⁹ such a possibility was very generally denied.

The pendulum of professional opinion seems now to have swung in the other direction. Authentic instances of functional hemianopsia have been published by several authors, among whom may be mentioned the names of David B. Lees, Mitchell and G. E. de Schweinitz, Dejerine and Vialet, Pierre Janet, Lannois and Tournier, and Wilfred Harris.

J. P. Nuel¹⁰, who wrote the section of Amblyopia and Amaurosis in de Wecker and Landolt's classical *Traité Complet d'Ophthalmologie* (1887), stated that hemianopsia in cases of hystero-epilepsy was never typical, and that although it was often homonymous, yet the line of demarcation between the blind and seeing halves of the field was not straight and did not pass through the fixation-point.

Lees' case¹¹ was observed in a boy, aged 11 years, who complained of severe and constant headache, of defective hearing as regards the left ear, and who was found to have anaesthetic areas on the left cheek, trunk, and limbs. When the eyes were examined, the lad was discovered to present double nasal hemianopia, a symptom that had vanished completely when examination was repeated on the following day. The case reported by J. K. Mitchell and G. E. de Schweinitz¹² was in a girl of 18 years affected with left-sided dysaesthesia, involving the leg, arm, chest, face, and ocular conjunctiva. The central vision (with astigmatism corrected) was normal, as were also the

pupillary reflexes. The visual fields for white, as well as for colours, were extremely small, and retained only on the temporal side. In other words, the condition was one of an irregular binasal hemianopsia. The sequel of the case was not stated by the writers.

Dereum¹² distinguished three modifications of the visual fields in hysteria: (1) concentric contraction; (2) central scotoma; and (3) hemianopsia. As regards No. 3, he remarked: "This is also exceedingly rare in hysteria, but not so uncommon in organic brain disease." He pointed out (as Féré had done before him) that the commonly associated anæsthesia of the conjunctiva distinguished this form of hemiopia from that caused by organic disease of the brain.

Pierre Janet¹¹ reported the following case.—Justine, a woman of 42 years, had been tormented for 20 years with the idea that she was the victim of cholera. She also suffered from various manifestations of hysteria, such as permanent contractures, subconscious writing, and somnambulism. After she had been free from symptoms for a period of two years, she complained of persistence of visual images, and then of right hemianopsia, together with contraction of the remaining portion of the field of vision. In addition to this remarkable symptom, Justine manifested incomplete anæsthesia of the right side of the body. Besides all this, she was almost deaf in the right ear, and had lost the senses of smell and of taste on the left side. It is important to note that the hemianopsia recovered in the course of a few days.

The case reported by Lannois and Tournier¹³ was of a complicated character, since hysterical symptoms had been preceded by a period of several months by a fracture of the skull, which had necessitated elevation of depressed fragments of bone.

Wilfred Harris¹⁶ reported a case in a married woman, aged 29 years, who suffered from analgesia of the whole body, and from left hemianopsia with contraction of the remaining half-fields. Her sight was 6/36 in the right eye and 6/24 in the left. It was suggested to the patient that she would be unable to see towards the right side, and next morning, when she woke up, she was totally blind, and remained so all the day. The pupils reacted perfectly to light. The patient recovered normal sight and perfect fields after about a month's treatment by suggestion and the wire brush. Harris's conclusion was "that hemianopsia, rarely bi-nasal, more commonly lateral and left-sided, with accompanying contraction of the remaining half-fields, may occur as a temporary phenomenon in hysteria."

The conclusion, however, is not accepted universally. For example, Gowers¹⁴ wrote: "Cases of hysterical hemianopsia are on record, but of a large number of cases that have come under my observation, one only *may* have been of hysterical origin." Parinaud,¹⁷ again, maintained that hemiopia was the one variety of visual insensibility that hysteria was incapable of simulating. He added that "in the Salpêtrière neither Charcot nor his pupils ever found a single example of hysterical hemiopia among the thousands of patients examined by them." He concluded, with Gilles de la Tourette¹⁸ and Freund,¹⁵ that published statements to the contrary were erroneous.

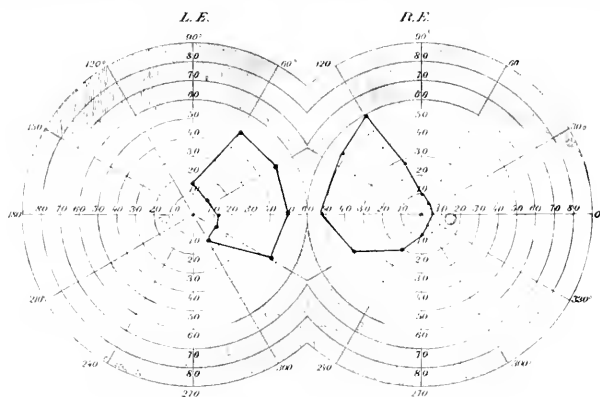
Pierre Janet¹¹ has recently published a curious case, in which during the course of treatment, homonymous hemianopsia of both eyes was substituted for a unilateral amaurosis that had been present for upwards of 10 years. The two visual fields eventually became, for all practical purposes, normal. The author suggested that when recovering from an hysterical amaurosis, the visual field might, in many cases, take an hemianopsic form. In his well-known book, *The Major Symptoms of Hysteria*,²⁰ the same writer

maintains the reality of hysterical hemianopsia, which he likens to motor hemiplegia occurring in hysterical subjects.

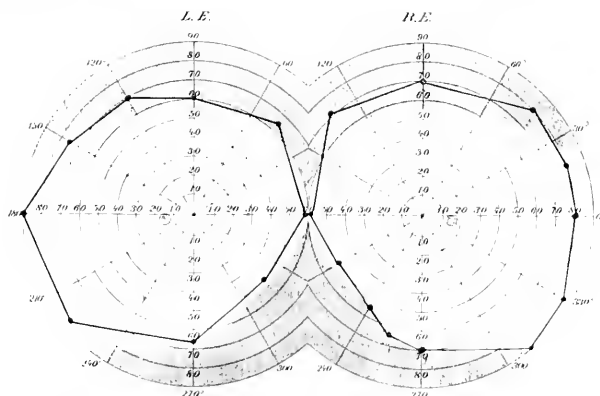
Case.

The following case, which I had an opportunity of watching when working with my friend Mr. Robert W. Doyne at the Royal Eye Hospital, Southwark, London, appears to be an example of hemianopsia of purely functional nature:—

A boy, 12 years of age, first attended the hospital on March 24th, 1905, with the history that his sight had been good until four weeks ago. Since then, he had been unable to do his school work,



and vision had progressively failed. The personal history brought to light the fact that the lad had sustained several more or less trivial accidents. Thus, three years ago, he had cut the outer end of



the left eyebrow by a fall on a stone step. In the summer of 1903 he was struck on the left eye with a cricket stump. Somewhat later he was confined to bed for several weeks in consequence of a bicycling accident. It was noted, however, that no immediate eye symptoms followed these various accidents.

and injuries. The boy is subject to what his mother calls "fainting fits," of which he has had several since the year 1903. He is emotional, crying on the slightest provocation. His mother states that he is "queer" at times, saying and doing "queer" things.

Father and mother healthy. The other children, two in number, are described as "delicate."

On admission. R. V. 5 mil, not improved. L. V. — hand-movements only. Pupils equal and active to light. Tested with a 5 mm. white square, the temporal fields are wanting (*see charts*), so that the condition is one of bi-temporal hemianopsia. Neither red nor green could be recognised. It was observed, probably as a result of subconscious sensation, that the fields appeared to be full when tested by a white pocket-handkerchief. The conjunctiva, both palpebral and ocular, was found to be more or less anæsthetic. The fundi were normal.

Treatment and Progress. The syrup of the iodide of iron, in teaspoonful doses, was administered three times a day. *April 14th, 1905.* Blister to left temple. *April 28th, 1905* — R. V. = 6/36. L. V. = fingers at four feet. Had complaints of sudden faintness without obvious cause. *May 12th, 1905.* R. V. = 6/18. L. V. = 6/36. *May 26th, 1905.* R. V. = 6/6. L. V. = 6/18. *July 17th, 1905* — Pupils equal and active. The conjunctivæ have recovered their sensation. R. V. = 6/6 (3), L. V. = 6/6. Fields, for a 5 mm. white square, of normal outline and practically of full extent (*see charts*). A hysterogenic zone was found on the right side of the nucha.

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TRANSLATION.

ORTHOSCOPIC SPECTACLE LENSES.*

BY

M. TSCHERNING.

PARIS, FRANCE.

THE question of the best form to give to the photographic lens has been much discussed, and that lens has now attained such a degree of perfection that it is difficult to foresee improvements of any importance.

It is all the more surprising that the problem of the best form to give to spectacle lenses, a problem which, in many respects, is related to that of the photographic lens, has been so little discussed.

It is over a hundred years since Wollaston recommended menisci, and yet we still continue to prescribe and to wear equiconvex (concave) glasses without being able to give any reason for doing so. Commercially planoconvex glasses and menisci are found, but they are very little used, at least in Europe; the commercial menisci, however, have a very slight concavity, which is almost the same for all numbers. I shall discuss later the question of the most favourable form to give to spectacles glasses. Let us put on a pair of spectacles and stand before a wall covered with a pattern and fix a point on the wall. The spectacle lens, like the photographic lens, forms an image of the surface of the wall, and it is this image which we look at.

The pupil of the eye plays the part of the diaphragm of the lens. As long as we hold the eye fixed, it is only a very small part of the wall near the point of fixation that we see clearly; all the rest is perceived in but a vague sort of way. We say that the small part around the point of fixation, which forms its image on the fovea of the retina, is seen in direct vision, all the rest in indirect vision. As a matter of fact, we are never placed under these conditions. During the whole of life, except during sleep, the eye is perpetually moving. We cannot even fix a given point for more than a few seconds without the sight becoming blurred (*Starrblindheit*). While we fix a point, our attention is drawn to another which we see in indirect vision; we then direct our gaze to fix this point, and so on. As we thus survey the field, so we survey the image formed by the spectacle lens. But, the centre of rotation of the eye is situated about 16 mm. behind the pupil. The latter is therefore constantly moved about, and we could believe that the problem of spectacles lenses would be very complicated in consequence of this mobility of the diaphragm. But it is the direct vision which is by far the most important. Now, the pencil which forms the image in the fovea always passes very near the centre of rotation. Therefore, as long as we concern ourselves only with direct vision, we can substitute for the real pupil an imaginary pupil placed at the centre of rotation of the eye, which will remain fixed. The image seen by the eye is that formed by the glass combined with the diaphragm, and it is this image which we should make as good as possible.

Most of the methods employed by makers of photographic lenses are not at our disposal. We cannot make use of several lenses, and consequently it is of no use to vary the index of the glass, which I shall here regard as constant and equal to 1.52. Further, we cannot vary the distance from the glass to the diaphragm; I shall take that distance as 28 mm., the glass being placed 15 mm. in front of the cornea, and the centre of rotation of the eye 13 mm. behind that membrane. All we can do is to vary the form of the glass. On the other hand, there is one circumstance which greatly facilitates our task—it is the smallness of the diaphragm, as compared with focal distance of the lens employed, we very rarely use lenses of a focal distance shorter than 60 mm. (16 dioptries). If we take the diameter of the pupil as 5 mm., the ratio is then 1:12 in the most unfavourable case. It therefore follows that the "axial defects," i.e., spherical and chromatic aberration, are negligible. It is otherwise with regard to "nonaxial defects"—astigmatism, the curving of the image, and the distortion. It is our duty, then, to determine the kind of glasses which reduces these defects to a minimum.

Astigmatism and Curving of the field.

A very simple experiment will demonstrate the astigmatism produced by oblique incidence. A biconvex lens, well stopped-down, is so placed that it forms the image of a luminous point on a screen. It is then rotated on its

vertical axis, say 30° . The image formed on the screen then changes to a spot elongated horizontally, and if the screen be approximated to the lens it forms at first a horizontal focal line, and as it approaches the lens still nearer, a vertical focal line is formed.

Let us replace the lens in its original position and take as object a large number of points arranged perpendicularly to the axis of the lens. The only point whose image is distinctly formed is that situated on the axis. Corresponding to every other point there will be two focal lines, the first of which has a tangential direction, the second a radial direction. The sum of all the first focal lines form the first focal surface which only touches the second focal surface, formed by radial focal lines, at a point situated on the axis. The concavity of the two surfaces is turned towards the lens. On the contrary, in the case of the virtual image their convexities are turned towards the lens and the first focal surface— that formed by the tangential focal lines— is the farther away. As the astigmatism depends on the obliquity of incidence, it is easily seen that it can be diminished by moving the diaphragm farther away, if at the same time the lens is replaced by a meniscus, so placed that the centres of curvature on the surfaces are in the vicinity of the diaphragm. The rays proceeding from the peripheral parts of the objects then meet the surfaces at an incidence approximately normal, and the image will be quite clear. But to find the best form to give to the lens we must have recourse to a calculation. I shall here only give results, the formula which I use for this calculation and for those which follow will be found in my article, *Dioptrique Oculaire*, T. II de l'*Encyclopédie française d'Ophthalmologie*, p. 139. One finds

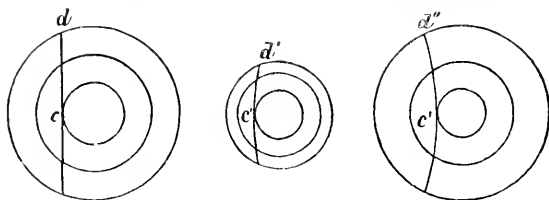


FIGURE 1.

that it is always possible to construct concave lenses in such a way as to abolish completely the astigmatism in oblique vision. There are two forms which satisfy that condition, for each number. They are both concavoconvex (menisci) with the concavity turned towards the eye, but the one is more curved than the other. It is the same for convex lenses below $7D$. In the case of stronger convex lenses it is not possible to abolish the astigmatism entirely, but there is one form (meniscus) which reduces it to a minimum.

At the same time that we abolish astigmatism we also diminish the curving of the field, but it is impossible to remove this completely. The lens which reduces the surface curvature to a minimum is a meniscus intermediate between the two which abolish the astigmatism. In the case of strong convex glasses, the same glass reduces the astigmatism as well as the surface curvature. The numerical results of the estimation will be given later.

The magnifying power of spectacle lenses.—Distortion.

The term distortion denotes a defect often shown in optical images: straight lines situated in the periphery of the field, are, in the image, represented by

curves sometimes with their concavity turned towards the centre (barrel-shaped distortion) sometimes their convexity turned towards the centre (crescent distortion.)

Let us draw a series of concentric circles around an axis and equidistant from each other. If the image be perfect it should also be formed of equidistant circles, but in most cases the distance between the circles varies with the distance from the axis, either in a diminishing or increasing degree. It is easy to see that, in the first case, straight lines in the periphery of the field will suffer barrel-shaped distortion, and in the second case crescent distortion (fig. 1). The distortion is, therefore, due to the fact that the magnification varies with the distance from the axis. This arises from the fact that the lens which forms the image is not aplanatic for the distance, from the diaphragm, at which it is placed.

In fig. 2, L is a lens and P_1 the diaphragm which is shown reduced to a point. P is the image of P_1 formed by the lens, O is the object and I its image. A and B correspond to two of the equidistant circles. Every ray which, after refraction should pass through the diaphragm P_1 should, before refraction, be directed towards its image P . We find the image of a point A

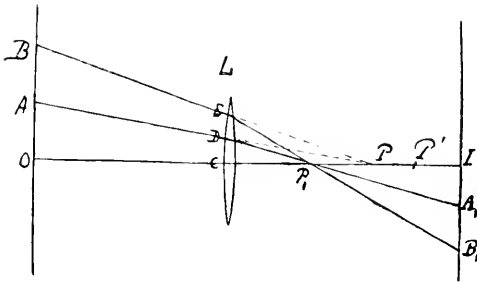


FIGURE 2.

by drawing the straight line $A D P_1$; after refraction it will take the direction $D P_1 A_1$ and A_1 will be the image of A . By repeating the process for point B , it is easy to see that $A_1 B_1 = A_1 I$. But this is only true as long as the lens does not present any appreciable spherical aberration. Otherwise the part in the neighbourhood of E will be more refracted than the central part and consequently will form an image of the diaphragm, P_1 , which is situated farther away than P . From this it follows that the distance $C E$ and consequently also the distance $I B_1$ will be greater than in the previous case. The image will be distorted crescentwise. This will be experienced by looking at a squared surface (*quadrillage*) through a strong convergent lens, when the pupil plays the part of diaphragm. We may also see the "quadrillage" distorted crescentwise; at the same time, the image appears hollowed out, but this is an illusion produced by the distortion of the lines; in reality, it is convex towards the observer. Concave lenses give a barrel-shaped distortion, as may easily be seen by looking at a window, for example. It is not difficult to estimate the magnifying power of spectacle lenses as long as we can ignore the spherical aberration. Without a glass, the object $O A$ is seen under an angle $A P O$ the short distance, $P P_1$ being

negligible in consequence of the distance of the object. With the glass, it is seen under an angle $D P_1 O$. If $DC = x$, $CP = a$, and $CP_1 = b$, we have

$$\tan D P O = \frac{x}{a}; \tan D P_1 O = \frac{x}{b}$$

and consequently the magnification

$$G = \frac{\tan D P_1 O}{\tan D P O} = \frac{a}{b}$$

If the spherical aberration is negligible we have

$$a = \frac{Fb}{F-b}$$

and consequently

$$G = \frac{F}{F-b}$$

The calculation gives the following values:—

+15D.	+10D.	+5D.	0—5D.	—10D.	—15D.
$G = 1.72$	1.39	1.17	1.088	0.78	0.70

In the case of convex lenses the magnification is >1 therefore these glasses magnify the objects while concave glasses diminish them.

There is no contradiction between the results, and it is a well-known fact that a lens placed at the anterior focus of the eye does not alter the size of the retinal image. Under these circumstances a concave glass does not diminish the retinal image, but it is displaced backwards so that it is seen under a smaller angle.

But the figures given above are true only for the central part of the lens, directly the line of vision approaches the periphery, the spherical aberration of the lens begins to be felt, and a is no longer equal to $\frac{Fb}{F-b}$; its value is

estimated by a more complicated formula; it is increased for convex lenses, and diminished for concave lenses. It therefore follows that the effect increases towards the periphery, both as regards the magnification by convex glasses, and the diminution by concave glasses. The short table below shows that variation of magnification is very pronounced, even for weak glasses, especially in the case of convex lenses. The distortion is also quite noticeable, even with long focussed lenses as can be easily ascertained.

Distance of centre.	0 mm.	5 mm.	10 mm.	15 mm.	20 mm.
+15	1.72	1.79	2.01	2.53	3.96
+10	1.39	1.42	1.51	1.71	2.07
+5	1.17	1.17	1.21	1.27	1.38
0	1	1	1	1	1
5	0.88	0.87	0.84	0.81	0.75
10	0.78	0.77	0.72	0.66	0.59
15	0.70	0.68	0.66	0.55	0.47

To abolish the distortion it is necessary to correct the spherical aberration of the glass with regard to the centre of rotation of the eye. Calculation shows that it is possible to obtain this result for concave glasses and for convex numbers below 13 dioptries.

As in the former case there are here also two forms (menisci) which comply with this condition; one has curvatures a little more pronounced than the more curved astigmatic form, the other has much more pronounced curvatures. Above 13D there is a form which reduces the distortion to a minimum. We shall find the numerical results later.

The Field of Spectacle Lenses.

The question of the field of spectacle lenses is intimately bound up with that of magnification. The extent of the field is found by drawing straight lines from the edges of the lens to the image which the lens forms of the centre of rotation.

Thus, Fig. 2, if E corresponds to the edge of the lens, the angle of the field is B P O. If we take half the diameter of the lens as 20 mm., and using the same terms as before, the field will be $\frac{20 \text{ mm.}}{a}$, while the field corresponding to the frame without a glass—the normal field—is $\frac{20 \text{ mm.}}{b}$. The field of the glass is therefore in relation to the normal field as $\frac{b}{a}$, or in other words the

magnification of the field is inversely as the magnification of the object. Therefore, convex lenses diminish the field, concave lenses increase it. It is well understood that the magnification of the object under discussion is that which corresponds to the most peripheral part of the lens. Therefore, in replacing a biconvex lens by a lens (meniscus) which gives an image without distortion, we increase the extent of the field, whereas the contrary occurs with concave glasses.

With the figures given we find the following estimations—

Field of direct vision.

	+15	+10	+5	0	-5	-10	-15
Equiconvex (concave) glasses	10°	19°	27°	36°	43°	50°	56°
Orthoscopic glasses (without distortion)	23°	27°	32°	36°	39°	42°	45°

Therefore, in the case of convex lenses, there is, a considerable gain in the extent of the field. In the case of concave lenses the field is diminished, but it is nevertheless, very extensive. The effect is the same, but still more marked, if we consider indirect vision. We find the field by substituting the pupil for the centre of rotation. The result of the calculation is as follows:—

Field of indirect vision.

	+15	+10	+5	0	-5	-10	-15
Equiconvex (concave) glasses	10°	25°	38°	48°	56°	63°	68°
Orthoscopic glasses	39°	42°	45°	48°	51°	53°	55°

Results.

The following tables show the radii of curvature of the different lenses mentioned here. R_1 represents the anterior surface, R_2 the posterior surface; but as I have ignored the thickness of the glass in making the calculations the values of R_2 will require correction.

As the form of the anastigmatic lenses varies with the distance of the object, I have made two series of estimations, one for infinity and the other for a distance of 33 centimetres, all the lenses are menisci with the concavity turned towards the eye. The concave anastigmatic lenses of over 10 D, whose anterior surfaces are slightly concave, form the only exception.

CONVEXES

Dioptres	For infinity						For 33 centimetres						Orthoscopic					
	Anastigmatic			Least curving			Anastigmatic			Least curving			A			B		
	A	R ₁	R ₂	A	R ₁	R ₂	A	R ₁	R ₂	A	R ₁	R ₂	R ₁	R ₂	R ₁	R ₁	R ₂	R ₂
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1	39	67	28	38	41	—	28	29	—	41	44	—	28	29	—	15,1	15,5	—
2	34	68	27	36	42	—	27	31	—	40	47	—	27	30	—	15,1	16	—
3	49	69	27	35	44	—	63	99	—	38	49	—	27	32	—	15,1	16,6	—
4	45	69	27	35	46	—	57	100	—	37	51	—	26	33	—	15,2	17,2	—
5	41	68	28	33	48	—	51	103	—	36	54	—	26	34	—	15,2	17,8	—
6	37	64	28	32	51	—	46	97	—	34	57	—	25	35	—	15,3	18,6	—
7	—	—	31	—	—	53	41	91	28	33	60	—	25	37	—	15,4	19,5	—
8	—	—	30	—	—	56	36	80	29	32	64	—	24	38	—	15,6	20,5	—
9	—	—	29	—	—	59	—	—	—	—	—	—	23	39	—	15,7	21,6	—
10	—	—	28	—	—	63	—	—	—	—	—	—	22	39	—	15,0	23,1	—
11	—	—	28	—	—	67	—	—	—	—	—	—	22	40	—	16,3	24,9	—
12	—	—	27	—	—	71	—	—	—	—	—	—	20	39	—	16,8	27,4	—
13	—	—	26	—	—	76	—	—	—	—	—	—	—	—	—	—	—	—
14	—	—	26	—	—	82	—	—	—	—	—	—	18,4	—	—	34,1	—	—
15	—	—	25	—	—	90	—	—	—	—	—	—	18,3	—	—	36,2	—	—
16	—	—	24	—	—	98	—	—	—	—	—	—	18,2	—	—	38,6	—	—
17	—	—	23	—	—	106	—	—	—	—	—	—	18,2	—	—	41,2	—	—
18	—	—	23	—	—	121	—	—	—	—	—	—	18	—	—	47,8	—	—
19	—	—	22	—	—	138	—	—	—	—	—	—	17,9	—	—	56,8	—	—
20	—	—	—	—	—	—	—	—	—	—	—	—	R ₁	—	—	R ₂	—	—

CONCAVES.

Dioptres	For infinity						For 33 centimetres						Orthoscopic					
	Anastigmatic			Least curving			Anastigmatic			Least curving			A			B		
	A		B	R ₁		R ₂	A		B	R ₁		R ₂	R ₁		R ₂	R ₁		R ₂
	R ₁	R ₂					R ₁	R ₂		R ₁	R ₂		R ₁	R ₂		R ₁	R ₂	
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1	71	63	28	27	41	38	103	86	28	27	44	41	28	27	—	15.1	14.6	—
2	80	61	29	26	42	36	120	82	29	26	47	40	29	26	—	15.1	14.3	—
3	87	38	29	25	44	36	142	78	29	25	49	38	29	25	—	15.1	13.9	—
4	97	36	30	25	46	35	172	74	30	24	51	37	29	24	—	15.2	13.6	—
5	110	34	31	24	48	33	215	70	31	24	54	36	29	23	—	15.3	13.3	—
6	125	31	32	23	51	32	285	66	31	23	57	34	29	22	—	15.3	13	—
7	144	49	33	23	53	31	412	63	32	23	60	33	29	21	—	15.4	12.8	—
8	167	47	34	22	56	30	719	60	33	22	64	32	30	20	—	15.5	12.5	—
9	181	44	35	22	59	29	2440	57	34	22	68	31	29	20	—	15.7	12.3	—
20			80	20	138	22	1850	54	36	21	73	30	29	19	—	15.8	12.1	—
18			61	20	121	23	704	32	65	19	239	24	24	12	—	19.9	11.3	—
16	1660	32	50	20	98	24	441	51	37	21	78	29	29	18	—	16.0	11.9	—
15	1060	34	47	20	89	25	327	48	39	20	74	29	29	17	—	16.2	11.8	—
14	571	35	44	20	82	26	262	46	40	20	91	28	28	16.7	—	16.4	11.6	—
13	483	37	42	20	76	26	222	43	42	20	101	27	28	16	—	16.6	11.5	—
12	368	39	40	21	71	27	195	41	44	20	111	27	28	15	—	16.9	11.4	—
11	290	41	38	21	67	28	159	39	47	19	125	26	27	15	—	17.2	11.3	—
10	236	43	36	21	63	28	143	35	54	19	164	25	26	14	—	18.1	11.1	—

(1) The enclosed numbers are negative, the anterior surface being concave.

Orthoscopic Lenses.

There is no lens which fulfils the three conditions at once, but we find that the anastigmatic form B is a near approach to the orthoscopic A. For that reason the anastigmatic B lenses produce but little distortion. The firm of Benoit and Berthiot has willingly made a set of lenses of this form under my directions: commercially they are known as orthoscopic lenses. If we replace the lens of a photographic camera by one of these lenses and place the diaphragm at a distance of 28 mm., we can get photographs which will correspond exactly to the image which would be seen by a person wearing these glasses. Fig. 3 shows a photograph taken with a $+10$ biconvex, while Fig. 4 was taken with an orthoscopic lens of the same strength. The superiority of the orthoscopic lens is very noticeable, both as regards the astigmatism and the distortion. We also note that the field is more extensive as the number of squares is greater than in the case of the biconvex lens.

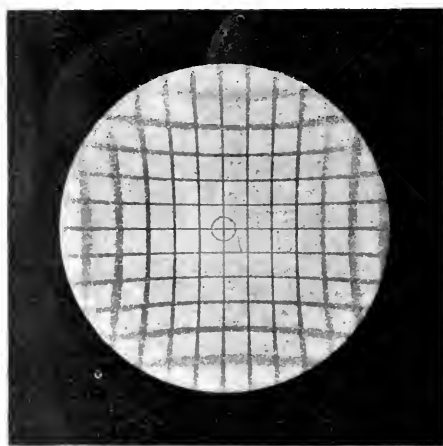


Fig. 3.

Biconvex (biconcave) lenses present no advantage and ought to disappear. The strong biconvex lenses are particularly bad owing to the distortion of the image and the astigmatism in the periphery of the field. A $+10$ D biconvex lens is equal near the margin to a $+12$ D spherical, combined with no less than -16 cylinder!

At the same time it diminishes the field considerably. At a distance of 30 cm. the normal field—the field of a neutral glass 4 cm. in diameter—would have a diameter of 40 cm., a $+10$ D biconvex lens reduces it to 27 cm. But, owing to the astigmatism, the peripheral parts of the field are hardly available; it is only the central part of about 12 cm. in diameter which is approximately free from astigmatism. In the case of a patient who has been operated on for cataract, and who wears a biconvex lens for reading, the field of clear vision is therefore not as large as a page of ordinary print.

The lens likewise reduces the field of indirect vision (from 66 cm. to 36 cm.)

The biconcave lenses are rather better than the biconvex, but they are, nevertheless, very bad. The peripheral astigmatism is a little less marked, but the spherical action is greatly increased towards the margins. A -10 D biconcave lens is equal to a -14 D spherical combined with -8 Cyl, towards the margins.

The distortion (barrel-shaped) is very marked. The extent of the field is increased—at 30 cm. distance the diameter is almost 1 metre—but it is only the central part, of about 25 cm. diameter, which is free from astigmatism. The field of indirect vision is equally enlarged. The use of bi-convex (bi-concave) lenses should therefore be given up. The weak numbers can be replaced by glasses having one plane surface, the plane side being placed in front in the case of concave glasses and behind in the case of convex lenses. For stronger glasses there is an advantage in using orthoscopic lenses. The advantage is particularly marked in the case of convex lenses, since the astigmatism and distortion are reduced at the same time as the field

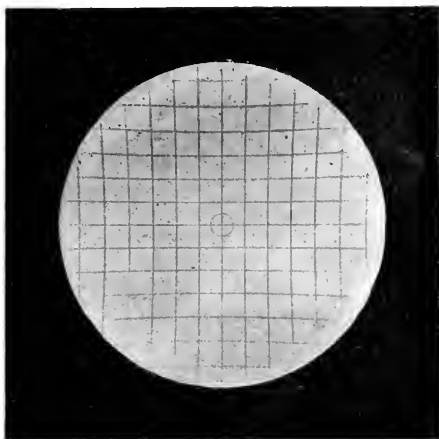


Fig. 4.

is enlarged. These glasses are, therefore, more especially to be recommended for patients who have been operated on for cataract. For myopes the advantage is less, since plano-concave lenses are almost free from astigmatism. Orthoscopic lenses, however, have the advantage of reducing the distortion as well.

The only inconvenience of orthoscopic lenses arises from what we call false images, produced by rays which enter the eye after undergoing double reflexion. They are of two kinds. In the first place, rays proceeding from exterior objects are reflected by the posterior surface of the lens, and afterwards return towards the eye by reflexion at the anterior surface. These rays, as a rule, are not very troublesome. In the second place, the rays, which are reflected by the surfaces of the lens, arise from the eye itself and the neighbouring structures. In the case of orthoscopic lenses the surface of the eye, cilia, &c., are situated near the catoptric foci of the surfaces of the lens.

Under good illumination some very pale images become visible, giving one the impression of a sort of luminous dust, which may be a little troublesome until one gets used to it.

J. JAMESON EVANS.

CURRENT LITERATURE.

NOTE.—Communications of which the titles only are given either contain nothing new or else do not lend themselves to abstract.

EXPERIMENTAL OPTIC NEURITIS AND SYMPATHETIC OPHTHALMITIS.

Rollet, É., and Aurand, L.—Experimental optic neuritis and sympathetic ophthalmitis. (*Névrites optiques et ophtalmia sympathique expérimentales.*) *Revue générale d'ophtalmologie*, février, 1909.

Rollet (Lyons) and Aurand (Lyons) set out to investigate the pathogenesis of optic neuritis by injecting into the optic nerve sheaths of rabbits: (1) micro-organisms, (2) toxins of the micro-organisms. The micro-organisms employed were pneumococcus, Pfeiffer's bacillus of influenza, Loeffler's diphtheria bacillus, streptococcus, staphylococcus, and tubercle bacillus. In doing this primarily in order to investigate optic neuritis, they had also in mind the possibility of being able to produce experimentally and to investigate microscopically a sympathetic affection of the opposite eye. This they were fortunate enough to do in one case, and one must admit that it probably forms the most interesting part of their work, although unfortunately it is less fully worked out than it should be, owing to the mislaying of a series of microscopic sections. Sometimes the eyes were enucleated during life and sometimes after death of the animal. In the latter case examination was always made of the other eye and of the brain, so as to omit nothing which might throw light on the question of sympathetic action.

(1) All the organisms or their toxins produced rapidly (sometimes from the third day) papillitis, papillary oedema, and congestion of the optic nerve. This was followed by atrophy of the nerve in those cases which were kept under observation long enough (one to three months).

(2) In certain cases of toxin injection the oedema of the nerve was propagated to the retina and then subsided (tuberculin T.R., strepto-toxine). In other cases (bacillus of Pfeiffer) there was a severe centrifugal inflammation propagated to the deep membranes of the eye, which led to chorio-retinohyalitis and dystrophic cataract.

(3) On the other hand, centripetal propagation of the infection seems to take place less readily since no micro-organism or toxin produced macroscopic meningeal or cerebral lesions. Diphtheria toxin produced, however, fatal paraplegia, and staphylococcic toxin caused transitory convulsive seizures.

(4) The papillitis is due to oedema and even congestion of the nerve and to its incipient (*embryonnaire*) infiltration, in accordance with the theory of Parinaud, rather than with that of dropsy of the sheath.

(5) The lesions—oedema and congestion of the papilla and nerve—seem to be primarily due to a very rapidly injurious action of the micro-organisms

on the vessels of the nerve, which causes an endo-perivasculitis with rapid sclerosis of these vessels, all other lesions being merely secondary. In fact, with the exception of the Koch organism, all the micro-organisms employed produced a rapid vascular sclerosis, localized to the anterior portion of the nerve.

(6) As to neuritis of toxic origin, the case seems to be less clear, for here vascular lesions are not so frequent, but that is probably due to the fact that the action of toxins on the vessels is slighter and slower than the action of the micro-organisms.

(7) In not one of the cases of experimental infective neuritis were found recent and distinct lesions of the ganglion cells of the retina or of the axis cylinders, such that one could suppose that the primary lesion, at any rate, was a nervous one.

Under the foregoing headings the reviewer has accepted the authors' summary of their work as regards optic neuritis, but their summary of the case where sympathetic ophthalmitis occurred is so brief as to be useless, and it will be necessary to consider this matter at somewhat greater length.

On the sixth day after the injection of a homogeneous fluid culture of human tuberculosis, there was marked papillary oedema. The animal became paraplegic on the twelfth day, and died on the fifteenth. *Post-mortem*: no tubercle was found in the lungs or other viscera, the serous membranes, meninges, or brain. Nor in the lesions which were observed were found classical tuberculous follicles, nor a single giant cell, which is quite in accordance with the anatomical characters of tuberculous infection by homogeneous culture, as studied by Arloing and Thévenot.

The primarily infected eye showed typical and distinct lesions, papillitis, thickening and enormous infiltration of the sheaths and the vaginal space. The tubercles or pseudo-tubercles which were found contained no giant cells, but only epithelial cells. The description is too long to quote at length. While the retina, ciliary processes, and iris were free from infiltration, the choroid was abundantly infiltrated up to the equator. The cellular tissues and muscles surrounding the nerve were infiltrated. There was an actual peri-neuritis.

Examination of the fellow eye shewed that the disc was a little prominent, and the neighbouring retina elevated by a slight exudate. The optic nerve was much congested, the vessels for the most part surrounded by extravasated red cells and by small cells. There was considerable thickening of the dural and pial sheaths. In the thickness of the dural sheaths there was a fusiform mass, a pseudo-tubercle formed of epithelioid cells without giant cells. The subdural space was filled with two similar masses, in the middle of which were vessels affected with endo-peri-arteritis. Finally, around the dural sheath was a slight layer of cellular infiltrate, which extended a little between the muscular fibres. Here again, then, there was peri-neuritis.

Thus there had been produced a tuberculous neuritis, not only of the eye directly inoculated, but also of the other eye. "It is possible to say, then, that we have here produced a true tuberculous sympathetic ophthalmitis, or, more correctly, a tuberculous sympathetic neuro-retinitis, and that for the first time, so far as we are aware."

"If it be objected that the neuro-retinitic lesions which we have observed in the second eye only represent a local outbreak of general tuberculous infection *via* the general circulation, seeing that the animal died, we would reply that it would be exceedingly strange if the only lesion indicating generalization were found in the opposite optic nerve. . . . We have seen that in the right (primarily infected) eye there existed tuberculous lesions in

the thickness of the dural sheath, in the vaginal space, in the optic nerve itself, and especially along its vessels, and, finally, that there was peri-neuritis. These same lesions are found in the left eye. . . . There existed, then, simultaneously tuberculous dural infiltration, vaginitis, neuritis, peri-vasculitis, and perineuritis of both optic nerves. Consequently, it seemed as if the infection followed five parallel paths, the tissue of the dural sheath, the vaginal space, the vessels of the nerve, the peri-optic cellular tissue, and perhaps the tissue of the nerve itself. This quintuple path perhaps explains the rapidity of the transmission (less than 15 days), whereas in man the appearance of sympathetic ophthalmia requires twenty days at least."

In the remainder of the paper the authors discuss the question as to how far the foregoing observation may be applicable to all forms of sympathetic ophthalmia; but enough has been said here to draw the attention of ophthalmic surgeons very closely to this important series of investigations on the elusive pathogenesis of sympathetic ophthalmitis. ERNEST THOMSON.

II.—CATARACT OPERATIONS.

- (1) Reber, Wendell.—The present status of preliminary iridectomy as related to cataract extraction. *New York Medical Journal*, April 6th, 1907, and *Pennsylvania Medical Journal*, September, 1907.
- (2) Alonso.—Indications for suture of the cornea after cataract extraction. *Anales de Oftalmologia*, Enero, 1908.
- (3) Bufill.—Depression of cataract. *Arch. de Oftalmologia*, Abril, 1908.
- (4) Kitamura, S.—A contribution to the operation of cataract in diabetics. *Klin. Monatsbl. f. Augenheilkunde*, Juni, 1908.
- (5) Vacher.—Second notice on iridectomy and capsulo-iridectomy by means of the punch. *La Clinique Ophtalmologique*, 25 juillet, 1908.
- (6) Smith, Henry, I.M.S.—The treatment of immature cataract. (Paper read at the Annual Meeting of the American Ophthalmological Society, July 16th, 1908.) *Lancet*, August 15th, 1908, and *Ind. Medical Gazette*, Vol. XLIII, 361 (October, 1908).
- (7) Post, M. H.—A successful operation on a cataract complicated by a dacryocystitis. *American Journal of Ophthalmology*, December, 1908.
- (8) Hæssig, B.—Report on the last 500 cataract extractions, paying special attention to complicated cases. *Zeitschrift für Augenheilkunde*, 1908, Ergänzungsheft.
- (9) Uhthoff, W.—On cataract operation on diabetics. *Bericht. aer. Ophthal. Gesells. in Heidelberg*, 1908.
- (10) Elliot, Major R. H. Some observations on cataract extraction. *Transactions Ophthalmological Society U.K.*, Vol. XXIX., Fasc. 1, 1909.

(2) Although suture of the cornea will always be an exceptional procedure, Alonso thinks it might be made use of with advantage in certain well-defined cases, as in dense capsule, where, after the removal of the lens, the pupil is still blocked with a thick membrane. In such, most surgeons would await

the healing of the wound, and then deal with the membrane by discission. Alonso, however, thinks it advisable to remove the capsule at once, and since such a procedure would be attended by great risk of loss of vitreous, advises a preliminary suture of the cornea. Other indications are subluxation of the lens and hypertension of the globe. HAROLD GRIMSDALE.

(3) In **Buñill's** case the patient had chronic dacryocystitis in both eyes and had lost one from an infected ulcer. After careful cleansing of the sac by repeated *lavage*, Buñill determined to extract the cataract in the other eye by the combined operation. After the iridectomy, he found it difficult to lacerate the capsule of the lens and at first thought of removing it in its capsule, but, fearing escape of vitreous, determined to depress the lens. The result was good. Buñill advises similar action in all cases where the lens is difficult to extract, before excessive pressure is made, which may easily cause loss of vitreous.

HAROLD GRIMSDALE.

(4) **Kitamura** reports from the eye clinique at Breslau the results of 112 cataract extractions in diabetic patients. Not a single eye was lost completely. Iritis, often accompanied by hypopyon, occurred more frequently than in otherwise healthy patients, and appears to form the chief complication. Vitreous and retinal hæmorrhages and diabetic retinitis were seen ten times, but were hardly due to the operation, although they impaired the optical results. Good visual acuity (1 to $\frac{1}{4}$) was obtained in 68.4 per cent., useful vision ($\frac{1}{4}$ to $\frac{1}{10}$) in 15.4 per cent., bad vision (less than $\frac{1}{10}$) in 12.6 per cent. On the whole, therefore, the results are satisfactory, and the operation need not be particularly feared in diabetic patients. C. MARKUS.

(6) **Smith** (Jullundur) advocates intra-capsular extraction of the lens as the treatment for unripe cataract. He states that even the normal lens can be extracted in its capsule as easily as a completely cataractous one by those skilled in the art. He employs a spatula and a strabismus hook (both large) applied over "the junction of the middle and lower third of the lens" in expressing the lens. Smith contends that extraction of immature cataract in the ordinary way with capsulotomy is hardly justifiable. He does not, however, differentiate with regard to the age of the patient or the variety of cataract formation. Ripening procedures are "either unsatisfactory or dangerous." In his experience, Förster's method of ripening has no effect on the cataract if the massage be done with a justifiable degree of pressure—that is, "pressure which will not dislocate the lens."

H. HERBERT.

(7) **Post** makes the very remarkable statement that none of the text-books by Noyes, Fuchs, Norris and Oliver, Schmidt-Kimpler, or Meyer say anything about dacryocystitis as a complication in cataract extraction. In a case of this kind where the patient's vision depended upon safe removal of a cataract from the eye on the infected side, and where on account of age and debility, excision of the sac was contra-indicated, Post tied the canaliculi, extracted with a large conjunctival flap, and dressed the eye with argyrol, 25 per cent. When the wound was safe, the ligatures were removed from the canaliculi.

ERNEST THOMSON.

(8) **Hæssig** presents us with an account of the last 500 extractions of senile cataract which have been performed at Basel. Particular attention is paid to the preparation of the patient. Catarrhal conditions are treated and the lacrymal apparatus especially is investigated with great care. The operation is performed by a corneal section in the usual way, but in the majority of cases, a preparatory iridectomy is done. The great objection to this is that the statistics plainly show that prolapse of the iris is more frequent after the double stage operation than after the combined.

But Haessig thinks that the other advantages far outweigh this bad feature, and at Basel it is the method more frequently chosen than the combined operation. We have ourselves found that prolapse is more frequent after extraction after a preliminary iridectomy than after combined extraction. Haessig does not mention another disadvantage which was pointed out to the reviewer by A. Stanford Morton, namely, that the old scar does not absorb the cocaine, and so the final extraction is apt to be painful. We have found this to be the case. The simple operation has gone more and more out of favour, on account of the great frequency of post-operative prolapse of the iris with all its evil consequences.

The figures given in the paper shew a percentage of about 92 of good results, but the whole value of the statistics is vitiated by the low standard adopted. The author has taken any visual acuity over 11 200, or about 3/60, as a good result. Personally, we should regard such a final vision of 3/60 as a failure, and we should only class a vision of 6/18, or more, as a good result. We are not told whether this is the corrected vision or not, but we presume so, for an uncorrected vision is of little value in estimating the result. Vitreous was lost only in 19 cases, or in about 4 per cent. No single eye suppurated; iritis was very infrequent.

Haessig offers the valuable advice that when hæmorrhage is feared, the section should be entirely corneal and no iridectomy should be made, if it can be avoided. As a whole, and even taking the low standard into account, the results are very good indeed, and are probably not improved upon in any other ophthalmic hospital. The communication closes with an interesting comparison of the present 500 cases with the previous 1,500.

T. HARRISON BUTLER.

(9) The results of over 100 operations are detailed, analysed, and tabulated by **Uhthoff** (Breslau). They are almost as good as those obtained in non-diabetics, although perhaps iritis was a little more frequent, being present in 6 per cent. of the cases. No eye was lost. In 68 per cent. V. = 6/6 to 6/18; in 18 per cent. V. = 6/24 to 6/60; and was less than 6/60 in 14 per cent. One patient died on the 5th day from coma. Many of the lenses were extracted without iridectomy; in these eserine was instilled after the operation, which, Uhthoff thinks, entirely obviates the danger of prolapse. He recommends that diabetics should not be put upon a strict diet. It was never necessary to use chloroform, which, according to some surgeons, predisposes to coma.

T. HARRISON BUTLER.

(10) **Major R. H. Elliot's** latest Indian results (1,000 consecutive cases), which show a percentage of septic incidence after extraction of 1.06, sound very difficult to beat. The paper here under consideration practically is an account of certain refinements of operative *technique* which have contributed to such excellent results. No ophthalmic surgeon can afford to miss reading the original paper if he wishes to be *au fait* with the latest cataract work, and therefore no attempt will be made here to do more than to state the main points:

(1) Careful antiseptics of the conjunctival sac is practised prior to operation by a combination of Herbert's and Elliot's methods, *i.e.*, the conjunctiva is first washed out with 1:3,000 perchloride lotion, and then, after the patient is on the table, the conjunctival sac is swabbed out with wool under a stream of boiled water "to its farthest recesses." The author admits "that the condition of the conjunctiva for a day or two after operation would sometimes brighten the operator." But in Madras the conditions are such as to demand great attention to the conjunctiva. The cornea also sometimes became abraded, but in none of the 1,000 cases referred to could permanent corneal opacities be traced to the method. (2) Elliot lacerates the capsule

with a Bowman needle, the shank of which is at least as big as the blade, prior to making the section. He claims that leakage of the anterior chamber is entirely preventable when doing this, but if it should occur, the chamber can be filled again with the irrigator nozzle against the puncture. By thus lacerating the capsule first, he is enabled to do it carefully and in any way he chooses, with a full chamber; and also to diagnose the character of the cataract and make the section of correct size accordingly. (3) Under the heading "the dangers of vitreous loss" the author discusses ordinary methods *versus* extraction within the capsule. (4) The value of irrigation in the toilet of the capsule and iris. To the reviewer this seems the most interesting part of an interesting article. To endeavour to synopsise the numerous "dodges" employed by Elliot to dislodge or to replace refractory cortex, capsule, and iris by means of the irrigator alone and without, as a rule, assistance from any other instrument, would not be fair to a writer who is obviously enthusiastic on the subject. "The longer I use irrigation, the more new ways of using it do I find; the charm of it never lessens." Elliot also employs irrigation in iridectomy for any purpose.

ERNEST THOMSON.

III.—VISUAL FIELDS IN RETINITIS PIGMENTOSA.

- (1) **Hepburn, Malcolm L.**—The visual fields in retinitis pigmentosa. *Royal London Ophthalmic Hospital Reports*, Vol. 17, part 11.
- (2) **Krauss, W.**—Clinical notes on the ring scotoma in retinitis pigmentosa. (*Zur Kasuistik des Ringskotoms bei der Retinitis Pigmentosa.*) *Zeitschrift für Augenheilkunde*, Januar, 1909.

(1) The characteristic feature in the fields of cases of retinitis pigmentosa, *viz.*: the presence of a ring scotoma, has long been recognized since it was first pointed out by von Graefe in 1855. By a careful examination **Hepburn** (London) has shown in his cases that, in addition to the ring scotoma, there were in four of the cases small islands of vision, or relatively functional areas, scattered throughout the scotoma. He especially draws attention to: (1) the fairly constant position and extent of the central visual portion which does not diminish perceptibly under ordinary illumination until the extreme periphery has entirely lost its function; (2) the few additional scotomata found in some of the cases; (3) the occasional tendency to the formation of a double ring scotoma; (4) the irregularities of the scotoma itself, though always attacking a well-defined region in the retina. The pathology of retinitis pigmentosa, and especially of the ring scotoma, is a very debatable question, although there are two main theories held. One ascribes the defect as due to some affliction of the optic nerve, and more especially of that bundle of fibres which supplies the intermediate zone of the retina; the other regards the special arrangements of the vascular supply of this region as rendering the vessels easily liable to disease or partial blocking of their lumen.

After fully discussing these theories, **Hepburn** concludes that the facts are more in favour of the vascular theory. He also considers that there are some grounds for considering that when the circulation from the short ciliary vessels is cut off, a part of the retinal circulation is capable of enlarging, in order to take its place and preserve the function of some parts of the retina. Numerous perimetric charts of fields illustrate the paper. C. DEVEREUX MARSHALL.

- (2) **Krauss** (Marburg).—In general, the loss of function, especially the

retinal torpor, is more marked in the periphery than at the centre. In Krauss' case hemeralopia was more developed centrally than peripherally. The case had been under observation for over three decades. There was present the usual typical ring scotoma. The author makes no mention of English work on ring scotoma, although a most excellent paper on the subject by Hepburn (see above) appeared last year in the *Reports of the Royal London Ophthalmic Hospital*.
T. HARRISON BUTLER.

IV.—LARVA IN ANTERIOR CHAMBER.

Thomas, F. G., and Parsons, J. Herbert.—A case of dipterous larva in the anterior chamber. *Transactions Ophthalmological Society U.K.*, Vol. XXIX, Fasc. 1, 1909.

Thomas and Parsons describe a case in which clinically a round worm, actually a larva, was seen in the anterior chamber. It had caused severe iridocyclitis, and, as found on pathological examination, detachment of the retina. The eye was enucleated, sectioned by G. Coats, and specimens were submitted to Dr. Shipley, of Cambridge, who reported that the "worm" was probably the maggot of a blow-fly. The authors speculate as to the path followed by the parasite on its way to the anterior chamber: (1) deposited in nostril, worked up nasal duct into lacrymal artery, and hence into central retinal or a ciliary artery; (2) deposited in nostril or conjunctiva and worked through the sclera. They seem to favour the first hypothesis. Three cases only of dipterous larvæ within the eye have previously been recorded. In each case it was in the anterior chamber and the oldest patient was 9 years. The others were 5, 5½, and 24 years (the present patient). It is stated that a drawing was made of the clinical appearances, and it seems a pity that it has not been reproduced by the Ophthalmological Society, since intraocular parasites are exceedingly rare in this country.
ERNEST THOMSON.

V.—X-RAYS AND CATARACT.

Paton, Leslie.—A case of posterior cataract commencing subsequent to prolonged exposure to x-rays. *Transactions Ophthalmological Society U.K.*, Vol. XXIX, Fasc. 1, 1909.

Paton's patient was 32 years old and had undergone a prolonged treatment for lupus on the cheeks with x-rays. During the time of the exposures she had had some swelling of the lids and a feeling of grittiness in the eyes, with occasional conjunctival hyperemia. Nine months later, sight began to fail from cataract, which was found to be "mainly in the form of a dense greyish white granular plaque lying in the posterior part of the lens well behind the nucleus, and probably against the posterior capsule." Both lenses similar. One cataract had been extracted, V.A. $\frac{6}{60}$ corrected; fundus normal.

In the subsequent discussion it was pointed out that the general appearance of the opacity was very similar to that occurring in glass-workers' cataract.

ERNEST THOMSON.

VI.—SOME SUBSTITUTES FOR COCAINE.

Brocq, C. N. le.—Report on the local anæsthetics recommended as substitutes for cocaine. The Therapeutic Committee of the British Medical Association. (*British Medical Journal*, March 27, 1909.)

This Report by **le Brocq** (Cambridge) on the local anæsthetics recommended as substitutes for cocaine is not without interest to ophthalmic surgeons. Accordingly, it may be briefly abstracted.

The substances investigated were stovaine, novocain, tropacocaine, beta-eucaine, alpyin, beta-eucaine lactate, nirvanine, holocaine hydrochloride, acoine, orthoform (new), and anæsthesine. The points specially investigated as regards each of the substances named were: 1. solubility in water; 2. sterilization of solutions; 3. local anæsthetic powers; 4. toxicity; 5. irritant action on the tissues; and 6. compatibility with adrenalin.

1. Solubility in Water.—If a drug was not soluble in water to the extent of forming a 2 per cent. solution, **le Brocq** regarded it as unworthy of competing with cocaine. Judged by this standard, the list was considerably shortened, since the following substances are all more or less insoluble: acoine, holocaine hydrochloride, anæsthesine, orthoform (new), and beta-eucaine. On the other hand, cocaine, stovaine, novocain, tropacocaine, beta-eucaine lactate, alpyin, and nirvanine are freely soluble in water, and as a 2 per cent. solution, they will keep for a short time without deterioration.

2. Sterilization of solutions.—Boiling decomposes and gradually destroys cocaine, so that the drug loses its activity.* On the contrary, stovaine, novocaine, beta-eucaine lactate, tropacocaine, alpyin, and nirvanine remain active after sterilization at a temperature of 115° C.

3. Local anæsthetic powers.—From experiments on frogs, rabbits, and human beings, **le Brocq** arrived at the following conclusions:—stovaine has a more powerful anæsthetic action (weight for weight) than any of the remaining local anæsthetics. Alpyin, beta-eucaine, lactate, novocain, and tropacocaine have anæsthetic properties about equal to cocaine. Nirvanine is inferior to cocaine.

4. Toxicity.—Toxicity was determined upon frogs, mice, and rabbits. It is necessary to note that the minimal lethal dose in frogs represents the action of the drug upon the heart, but in mammals its action upon the central nervous system.

If the toxicity of cocaine be represented as 1, then

The toxicity of Alpyin	...	will represent	1·25
" " Cocaine	...	"	1·0
" " Nirvanine	...	"	0·714
" " Stovaine	...	"	0·625
" " Tropacocaine	...	"	0·500
" " Novocain	...	"	0·490
" " Beta-eucaine lactate	...	"	0·414

5. Irritant action on the tissues.—It has been stated that gangrene and sloughing of the tissues have followed the use of certain of the substances now under investigation. The effect is extremely important. Cocaine was taken as the standard. Ten minims of a 10 per cent. solution of the drug were injected beneath the skin of the abdomen of rabbits, previously washed and rendered aseptic. After the operation the part was kept under observation

* The accuracy of this statement is open to question. It is quite certain that a solution of cocaine (2 per cent.) may be boiled again and again without appreciably altering its powers of anaesthesia on the conjunctiva and cornea. EDITOR.

for several hours, and then inspected daily for one week longer. Without going into detail, it may be broadly stated that the irritant action of stovaine, beta-eucaine lactate, and tropacocaine was found to be far greater than that of cocaine. Indeed, novocain was the only substance superior to cocaine in this respect.

6. Computability with adrenalin.—All the local anæsthetics are compatible with adrenalin, provided the solutions are fresh and have not been kept long. After a day or two, the adrenalin itself is apt to decompose unless it has been preserved in stoppered bottles of opaque glass.

Conclusions.

Le Brocq's conclusions may be given in the author's own words :—

"If novocain and tropacocaine be first compared, their toxicity and anæsthetic properties are, roughly, equal; but the irritant action of tropacocaine is far greater than that of novocain; in other respects their actions are similar, therefore novocain is a more suitable drug than tropacocaine.

"On comparing novocain with beta-eucaine lactate it is seen that while the anæsthetic value is roughly about equal, the toxicity of beta-eucaine lactate is slightly less than that of novocain, but the irritant action of beta-eucaine lactate is far greater than that of novocain. It appears, then, that while beta-eucaine lactate has only a slighter degree of toxicity to recommend it in preference to novocain, its irritant action far and away overshadows any such slight advantage, and novocain is recognised as undoubtedly the better drug of the two.

"Finally, it only remains to compare novocain with stovaine. The former drug is less toxic and much less irritant; indeed, its specific action on nerve fibres is so great that it has practically no destructive effect on the other tissues; stovaine is more toxic and considerably more irritant.

"The one definite advantage which stovaine possesses over all the other local anæsthetics is its greater injurious action on nerve fibres, as shown by anaesthesia. Nevertheless, the specific action of stovaine on nerve fibres is less than that of novocain, since stovaine destroys other tissues besides nerve fibres. If stovaine and novocain be given in doses, so that their anæsthetic action is the same, both the irritant and toxic effect of the former drug, even in the smaller dose in which it is administered, are greater than the relatively larger doses of the later.

"I come to the conclusion, therefore, that of the drugs which have been investigated, novocain is most satisfactory for general use. Its anæsthetic action is equal to that of cocaine, and its toxicity and general destructive power on the tissues are very much less."

SYDNEY STEPHENSON.

VII - ANASTIGMATIC CATARACT GLASSES.

- (1) E. Hertel (Jena) — The Practical Value of the new Cataract Lenses. *Bericht der Ophthalmologische Gesellschaft in Heidelberg*, 1908.
- 2 von Rohr, M., (Jena). — The theory of anastigmatic cataract lenses. *Bericht der Ophthalmologische Gesellschaft in Heidelberg*, 1908.

(1) Hertel's communication covers the same ground as the one which follows by Rohr. It is illustrated by two good plates, which show the appearance of near and far test types as seen at angles of 0°, 6°, 12°, 24°, and 30° through

four kinds of lenses : biconvex, plano-convex, periscopic, and anastigmatic. At 0° and 6° there is not much difference, but with increasing obliquity, the advantage of the reformed lens becomes more and more apparent. At 30° the letters are quite distinct and sharp through the anastigmat, but all the other varieties yield only a complete blur. The plano-convex is better than the biconvex, the periscopic beats the plano-convex, the doublet is far better than all the old forms. Carl Zeiss, Jena, can supply these lenses, which should be invariably prescribed for all those patients who can afford to pay for them.

T. HARRISON BUTLER.

(2) When we order glasses we only, as a rule, try to get a perfect result when the subject looks through the centre ; when he looks eccentrically, many optical aberrations appear, and the result is not at all satisfactory. Toric lenses only try to meet the difficulty in a purely empirical manner. When we come to consider cataract lenses of 10D. and over, the question is more important, for the errors are greater and the resulting fall in acuity more pronounced. The author shews that no simple lens can achieve the desired object, but that a couplet enables us to provide much more accurate peripheral vision. We can not only eliminate much of the spherical aberration, but also the chromatic as well. The correction can be made almost perfect within an angle of 15° from the line of direct sight.

T. HARRISON BUTLER.

VIII.—SNOW OPHTHALMIA.

Gonin.—Snow Ophthalmia. [*L'ophtalmie des neiges Ophthalmia nivalis*] *Ann. d'Oculistique*, T.CXI., p. 161, Sept., 1898.

Gonin (Lausanne) finds that so-called snow-blindness consists in conjunctivitis with photophobia, blepharospasm, and myosis, and he considers that it would be more accurately described as snow-ophthalmia. Blurring of vision is exceptional, and seems to be due to the persistent myosis. Among 50 cases the author saw only two in which there were visual troubles, probably of retinal origin. In one of these the symptoms were quite transient "floaters," while in the other there was dazzling for two days, followed by dimness of sight lasting two months, and associated with doubtful retinal edema. In one case the author found, in addition to conjunctivitis localised in the areas left exposed by the open lids, ulceration of both corneæ in the corresponding regions. These healed rapidly, like superficial burns. The conditions described correspond to those found by Widmark to result from exposure of the eyes to ultra-violet rays, and it would seem that they are caused by the action of such rays in the light reflected from the snow. This explains why mountaineers have found it necessary to protect their eyes from the action of even the most oblique rays by wearing gauze sides on their dark glasses. Individual predisposition plays a considerable part in the causation of snow ophthalmia, which does not come on immediately after exposure, but usually during the following night, and yields rapidly to treatment with compresses, either iced or tepid, to bathing with sulphate of zinc lotion, or to application of white of egg. For protection, the smoked glasses usually worn are efficient, cases of the disease usually occurring when they have been taken off in mists or dull weather, but as they interfere with the view they may be advantageously replaced by yellow glasses, which the author has found satisfactory. Part of the ultra-violet rays are absorbed by the lens, which explains the relative

immunity of the retina from dazzling by snow glare, but their action seems to play an important part in the causation of erythropsia, which has therefore a certain aetiological relation to snow ophthalmia.

R. J. COULTER.

IX.—OPERATIONS.

- (1) de Berardinis, D.—Rodent ulcer of the cornea treated by heteroplasty of the corneal tissue of the rabbit. *Annali di Ottalmologia*, Vol. XXXV, Fasc. 10-11.
- (2) de Berardinis, D.—Results of some blepharoplastic operations. *Annali di Ottalmologia*, Vol. XXXV, Fasc. 10-11.
- (3) Birdwood, Major G. T.—A case of Krönlein's operation for orbital sarcoma. *Ophthalmic Review*, March, 1907.
- (4) Darracq.—Ptosis: Motais's operation. *L'Ophthalmologie Provinciale*, October, 1907.
- (5) Giuseppe, Tito di.—Operative interference in cases of Wernicke's nuclear paralysis. *Rivista Italiana di Ottalmologia*, June-July, 1907.
- (6) Steiner.—A contribution to the surgery of the eyelids. *Annales d'Oculistique*, février, 1908.
- (7) Falchi.—An operation for the remedy of central coloboma of the eyelid. (Metodo di blefaroplastica per il coloboma centrale della palpebra.) *La Clinica Oculistica*, Feb., 1908.
- (8) Meyer, Wiener.—Case of severe neurasthenia relieved by a partial section of the external rectus. *Medical Fortnightly*, February 25th, 1908.
- (9) Clarke, Ernest.—A method of suturing the lateral recti to insure greater mobility of the stump after enucleation of the eyeball. *Lancet*, May 23rd, 1908.
- (10) Delord and Revel.—The treatment of entropion and trichiasis by the sluice-gate method. *Annales d'Oculistique*, mai, 1908.
- (11) Aphthomas, G.—Tumour of the orbit removed without enucleation and without loss of sight. *British Medical Journal*, May 16th, 1908.
- (12) Nicati.—My operation for the correction of trachomatous entropion of the upper lid. *Annales d'Oculistique*, mai, 1908.
- (13) Velez.—Five new cases of implantation of fat after enucleation. (Cinco casos mas de implantacion de grasa despues de la enucleacion.) *Annales de Ophthalmologia*, Mayo, 1908.
- (14) Meanor, W. C.—The treatment of ptosis. *Pennsylvania Medical Journal*, July, 1908.
- (15) Bergemann.—On Kuhnt's keratoplasty. *Zeitschrift für Augenheilkunde*, Juli 1908.
- (16) Calderaro. A contribution to the study of keratoplasty. *La Clinica Oculistica*, September, 1908.

- (17) Knapp, Paul.—Two cases of blepharoplasty after Budinger. *Klin. Monatsbl. für Augenheilkunde*, September, 1908.
- (18) Fergus, A. Freeland.—Ptosis operations. *Trans. Ophthalm. Society U.K.*, Vol. XXVIII, 1908.
- (19) Mackay, George.—Note on a case of arterio-venous aneurism treated by ligature of the common carotid artery. *Ibidem*.
- (20) Hudson, A. C.—Thiersch graft of orbit. *Ibidem*.
- (21) Theobald, Samuel.—A simplification of de Grandmont's operation for ptosis. *Johns Hopkins Hospital Bulletin*, November, 1908.
- (22) Cabannes, C.—A new operation for pterygium. *La Clinique Ophtalmologique*, 10 décembre, 1908.
- (23) Brooksbank-James, C. T.—Operative treatment of strabismus. *Medical Press and Circular*, 23rd December, 1908.

(1) In de Berardinis' case a graft from a rabbits' cornea was held in place by slipping it under the conjunctiva previously dissected up for the purpose. After four days, the graft was found to be adherent, and after several weeks, had a normal, smooth, polished surface of greyish hue. A. A.

(2) de Berardinis' article is interesting especially on account of the figures. In thirteen blepharoplastic operations, he had recourse to pedunculated flaps only on three occasions. In all the other cases dermo-hypodermic grafts were taken from the arm. This latter method is capable of giving excellent results, in spite of all that has been said, but on the following conditions: extensive dissection of the palpebral cicatrix, detachment of its edges, excision of the cicatricial tissue; permanent tarsorrhaphy for four or five months, or more, is indispensable not only to make sure of the graft over a large surface but also to avoid disappointing retraction; very large flaps (at least double or more the loss of substance to be filled in), complete removal of the subcutaneous cellulo-adipose tissues, thus rendering them very thin; numerous sutures all along the filled edge of the wound in order thoroughly to fix the flap and facilitate its adhesion and nutrition; light compressive dressing by a small roll or tampon of gauze not extending beyond the edge of the flap; occlusion of both eyes for five days; liquid food; extreme care in removing the dressing, since traction a little too brusque may completely or partially tear away the graft; gentle and uniform compression by the dressing, even several days after perfect adhesion of the graft. Operating in this manner one need not fear necrosis of the graft, nor that it will be insufficient or inclined to shrivel. The remote results are excellent, the new portion remains large and supple, perhaps even showing folds like a normal eyelid, and only recognizable by the fact that it is slightly paler in colour than the surrounding skin.

A. ANTONELLI.

(3) Birdwood's patient was a native, aged 40 years, who was admitted into the Ophthalmic Hospital, Agra, with a large orbital tumour which pushed the right eyeball forwards and inwards; the patient was only able to count fingers with this eye. As the eyeball was not involved, it was decided to save it, and Krönlein's operation was performed. The tumour was the size of a small hen's egg. The patient made a quick recovery, and when discharged five weeks later, he was able to recognise small objects. What the ultimate result was as regards recurrence or otherwise we are not told.

C. DEVEREUX MARSHALL.

(4) **Darracq** discusses the various forms of ptosis, and records five cases successfully treated by operation, one of them by Motais's method, which he considers the best when the affection is of a paralytic nature.

R. J. COULTER.

(5) **Giuseppe's** paper is a discussion on the causation of nuclear paralysis of the third nerve. In the case which forms the text, the author attributes it to digestive disturbances due to eating shell fish. The ptosis was relieved by the operation of Angelucci, which is properly described as the best for such cases.

H. GRIMSDALE.

(6) **Steiner**, of Java, suggests the following improvements in the *technique* of lid operations.—1. When suturing the palpebral conjunctiva to avoid risk of damage to the cornea by the knots and to enable the sutures to be removed without everting the lid he passes his sutures so as to have the bight on the conjunctival surface, then threads both ends of each suture on a single needle which he passes through the lid to the skin, where he ties them over rolls of gauze. 2. For senile ectropion he enters a von Græfe's knife through the skin at the outer canthus, passes it across to the inner canthus just below the mucous membrane, and in withdrawing it cuts downwards so as to split the tissues of the lid into two layers. He then inserts Snellen's sutures, by tightening which he pulls the conjunctiva down into the groove which has been made for it. 3. To avoid the difficulty in obtaining local anaesthesia when operating with the usual lid clamps, e.g., those of Snellen or Knapp, he has devised a new form of clamp, which consists of a metal plate to which a double hook, intended for fixing the edge of the lid, is united by a hinge. These can be fixed firmly against each other during the operation by means of a screw, but are separated by a spring when the screw is loosed. The difference in principle between this and the older instruments is that instead of the base of the lid being compressed against the plate by a metal band, the edge of the lid is fixed to it by two spikes.

R. J. COULTER.

(7) **Falchi** recalls the difficulty of treating these deformities, and describes the following method.—He scarifies the margins of the coloboma and of the remaining parts of the upper and the whole length of the lower lid, and then makes a vertical incision upwards from the external commissure through all the thickness of the lid, including the conjunctiva. Next, he sutures the inner thirds of the two lids together, and brings the outer third of the upper lid to fill the coloboma and sutures it to the middle third of the lower. Lastly, he cuts from the skin outside the canthus a rhomboidal flap to fill the remaining gap. This leaves a raw surface which he fills with a graft from the arm. He gives photographs which show the successful results in two cases.

HAROLD GRIMSDALE.

(8) **Clarke** (London) in order to improve the mobility of the stump after excision of the eyeball, takes special pains to isolate the lateral recti, and, when the excision is complete, sutures with catgut one lateral rectus to the opposite lower lip of the conjunctival opening, and the other rectus to the opposite upper lip of the conjunctival opening. The superior and inferior recti are not sutured, as this proceeding would hinder the lateral movements, which are of such great importance.

ERNEST THOMSON.

(9) **Delord and Revel** describe a method of operating for trichiasis devised by True, of Montpellier, and give tabulated results of over 60 cases in which it has been employed. This operation is performed as follows.—1. An incision is made immediately behind the displaced eyelashes extending to the extreme ends of the lid in total cases and for about twice the length of the diseased area in partial cases. 2. The eyelid is split into two layers, the anterior consisting of the skin and orbicularis, and the posterior

containing the tarsus and conjunctiva. This division should penetrate to the adherent margin of the tarsus or even further. 3. The anterior layer is pulled back over the posterior until five or six millimetres of the raw surface of the tarsus are left exposed and is fixed in that position by sutures passed from within outwards. When the palpebral aperture is narrowed a canthoplasty should be added as part of the operation. The authors claim that this procedure is the operation of choice in trichiasis, that it is equally applicable to both the upper and lower lid, and that it is a rational one, since it raises the layer of skin, lowers the tarso-mucous layer, straightens the tarsus (by cicatricial contraction of its anterior surface which is left bare) and reconstitutes the lid margin.

R. J. COULTER.

(11) **Apthomas'** patient, a woman of 24 years, complained in 1895 of gradually increasing prominence (three years) with loss of sight of the right eye. Eye was pushed directly forwards, movements fairly free, pupil reactions normal, V. shadows. Media clear; some congestion of disc. Six and a half years later, when next seen by Apthomas, there was increased prominence but V. had improved to $\frac{6}{24}$.

Operation.—Canthus divided, conjunctiva incised horizontally, external rectus divided, finger exploration of orbit. A well-defined tumour with a smooth surface was found; it extended backwards in close contact with the lower and outer side of the sheath of the optic nerve. The tumour was removed "with the tip of the finger and the help of a blunt dissector and patience" without tearing its capsule, and the parts replaced. Three years after operation, no proptosis, R.V. = 6 12 and J. 4, paresis right external rectus, slight convergent strabismus and exophthalmos. Pathological examination by Professor Delepine and Dr. A. Sellers, showed that the tumour, which was about the size of a pigeon's egg, and possessed of a fairly distinct capsule, had the structure of a cavernous angioma. There was no clear evidence that it was angio-sarcomatous.

ERNEST THOMSON.

(12) **Nicati** gives drawings illustrating the steps of his previously-described operation for the cure of trachomatous entropion of the upper lid.

(13) **Velez** thinks highly of this method of improving the stump after enucleation. The fat is taken from the gluteal region of the patient, and therefore is more likely to become attached than the animal's eyes, used by Lagrange for a similar purpose. Velez advises that excision rather than evisceration be performed, since the capsule of Tenon gives a better bed for the graft than the sclerotic. The chief point in the performance of the operation is to make the graft the right size so that it shall not be strangulated during the suturing.

HAROLD GRIMSDALE.

(14) **Meanor** (Beaver, Pa.) has advantageously modified Hess's operation for ptosis by passing three additional sutures through the two lid surfaces in such a way as to form an unyielding and barely distinguishable fold just beneath the brow.

C. A. O.

(15) **Bergemann's** (Husum) paper is almost entirely a clinical one, a collection of cases, chiefly corneal ulcers, in which a flap of conjunctiva has been grafted on to the diseased area of the cornea with highly satisfactory results. A concentric incision is made into the conjunctiva 4-7 mm. from the limbus. The conjunctiva is then undermined up to the cornea, and here separated with scissors; the flap is now dissected free up to its attached ends, so that it can be easily slipped over the cornea, where it is sutured in the required situation. It is important to make the flap sufficiently large, as it is apt to shrink, and to carry with it as little sub-conjunctival tissue as possible. Both eyes are bandaged for the first day. The eye is dressed on the second day. The defect in the conjunctiva is rapidly repaired by the adjacent conjunctiva. As

soon as the graft is adherent, that is to say, after about 8-10 days, one of the ends can be cut adrift, and a few days later the other end may be similarly treated.

T. HARRISON BUTLER.

(16) **Calderaro** reports a case of keratoplasty after the method of Speciale Cirincione. The patient, a woman aged 66, had an epithelioma of the cornea; this was circumscribed by a trephine and the diseased tissues removed down to Descemet's membrane. Then, with the same trephine, a circular piece was excised from the cornea of a woman whose eye was in a state of absolute glaucoma. This piece included the whole thickness of the cornea. It was laid in the bed prepared for it by the excision of the tumour and held in place with the finger under slight pressure for fifteen minutes. This procedure is necessary for the success of the operation. The flap healed readily into place and retained its transparency well, the chief point, according to Calderaro, on which rests success, is that the tissues on which the flap is to be grafted, are normal and not cicatricial; if the bed be a scar, there can be no hope of success. No corneal tissue must remain at the bottom of the bed, which must be formed by Descemet's membrane only. Finally, the graft must be taken from another human cornea, the younger the better. Calderaro is of opinion that any fixation of the inserted flap by sutures is harmful and prejudicial to the life of the graft.

HAROLD GRIMSDALE.

(17) **P. Knapp** adopted Bädinger's method and transplanted a skin-cartilage flap from the ear in two cases requiring restoration of the upper lid. The first case was one of cicatricial ectropion due to the action of sulphuric acid; the second patient had lost the outer half of his left upper lid in a fight. Knapp formed first by dissection a conjunctival flap from the upper fornix and turned it down, then a piece 2cm. long and 12mm. broad was cut out of the ear and grafted on the conjunctival flap, where it was fixed with sutures. The results were very satisfactory, the use of cartilaginous tissue in blepharoplasty having obvious advantages.

C. MARKUS.

(18) **Fergus** (Glasgow), after reviewing the various classes of operation for ptosis and incidentally tilting at those operations depending for success upon the formation of cicatrices by sutures, describes an operation "which is probably very similar to that of Gillet," in which a considerable portion of skin and underlying tarsus is entirely resected. The upper portion of the tarsus which remains is sutured to the strong fibrous tissue which comes down from the occipito-frontalis to the top of the tarsus by means of van Hoorn's No. 00 gut. The skin edges are then united. The gut sutures absorb in ten days. A patient, of whom photographs are shown, can open his eye nearly as widely as under normal circumstances and can close it tolerably well. It is claimed that the elevation of the lid is put under the influence of the occipito-frontalis.

In the discussion which followed G. W. Roll pointed out that Hess's operation, which is one of those which had fallen under Fergus's condemnation, was a purely plastic operation not dependent on the sutures.

ERNEST THOMSON.

(19) In **Mackay's** (Edinburgh) case of traumatic arterio-venous aneurysm of the right orbit (of which a note was published in these *Transactions* for 1907, page 178) the result of treatment by ligature of the common carotid has been entirely satisfactory. The exophthalmos and the bruit have disappeared. V.A. has improved from R. fingers at $3\frac{1}{2}$ meters, L. $\frac{5}{8}$ to R. $\frac{6}{16}$, L. $\frac{6}{18}$. A convergent strabismus of 20° resulting from paralysis of the right externus has lately been reduced to 5° by tenotomy of the internus.

ERNEST THOMSON.

(20) **Hudson** reports a case of exenteration of the orbit in which, a month later, the whole cavity was lined by a single Thiersch graft from the right

arm. A protective gauze dressing was not disturbed till the sixth day, when the graft was found to have taken throughout. The orbit was lined throughout with healthy skin a fortnight later. ERNEST THOMSON.

(21) **Theobald** has performed the following modification of de Grandmont's operation in a case of bilateral acquired ptosis, the result of general myasthenia.—Under cocain instillation, 10 per cent, followed by intratarsal injection of cocain and adrenalin, an incision was made through the conjunctiva and the whole length of the cartilage parallel with and about 3.5 mm. from the border of the lid. A second incision was made *parallel with the first* and about 3 mm. from it, and the included strip of cartilage and conjunctiva was excised. The edges of the cartilage were brought accurately together with three fine black silk sutures. The stitches were removed on the fourth day; they gave no trouble. The ultimate result was practically equal to the immediate result *qua* elevation of the lid margin. For the differences between this operation and those of de Grandmont, Gruening, and Bowman, the original should be consulted. It may be mentioned that Gruening's operation had been performed by Theobald on the other eye and had not been a success. ERNEST THOMSON.

(22) The operation of **Cabannes**, which he calls "operation by exclusion of the pterygium with suture of conjunctival sliding flaps", consists in only dissecting up the pterygium partially, drawing it back to the caruncle and leaving it there, dissecting up the conjunctiva above and below, making vertical liberating incisions of the conjunctiva at the upper and lower vertical meridian of the cornea, sliding these flaps over the bed of the pterygium and suturing them together. The pterygium itself is not excised if small. If large the corneal part only is excised. Left to itself it shrinks. The author holds that recurrence after the ordinary operation is due to too large a resection and consequent formation of cicatrices which encroach progressively on the cornea. ERNEST THOMSON.

(23) **Brooksbank James'** operation of advancement does not seem to differ materially from that of other operators, who prefer, as does the author, to make a careful dissection of the tendon from its scleral and conjunctival attachments. James knots his threads at their posterior and not at their corneal ends, so that they do not irritate the cornea; this effect being obtained by first getting a posterior hold on the dissected conjunctiva and capsule, then burrowing through the episcleral tissue adjacent to the cornea and only finally passing through the muscle near to the point of entry. With Brooksbank-James' post-operative treatment by double bandaging and six days in bed, the reviewer is in entire agreement, although it is not always easy to persuade the patient of its necessity. ERNEST THOMSON.

X.—THE RETINA AND THE KIDNEYS.

zur Nedden, M. Experimental Researches on the Relationship between the Retina and the Kidneys. *Bericht der Ophthal. Gesellsch. in Heidelberg*, 1908.

This paper by zur Nedden (Bonn) details a very real advance in our knowledge of the essential pathology of those changes in the retina, arteries, and other organs which are associated with Bright's disease. zur Nedden's research is the most interesting of the many he has published in recent years.

If a dog be immunised with crushed kidney tissue from a rabbit, anti-bodies to rabbit's kidney are formed in its blood. These anti-bodies are toxic not only to a rabbit's kidney, but also in a lesser degree to the liver and the brain. We must assume that the liver and the brain contain proteid groups which are identical with those in the kidney. The author prepared such an anti-serum, or nephro-toxin, by injecting two crushed rabbit kidneys under the skin of a dog. This injection he repeated twice after an interval of 4 to 5 days. The blood reacted by generating an enormous quantity of nephro-toxin. If the serum were injected into a rabbit's blood-stream, the animal developed a well-marked nephritis, whose essential nature was a breaking-down of the epithelium of the renal tubules. So far, zur Nedden only repeats experiments carried out by many other pathologists. But he went on to determine the action of this nephro-toxin upon the retina.

If the serum were injected into the aorta, zur Nedden detected with the ophthalmoscope two hours later, delicate, bluish-white, streaky, somewhat prominent patches in the retina, which rapidly became more marked and increased in size. In from 6—8 hours the process had reached its height. The patches had become confluent and occupied large areas of the fundus, between which normal retina was still visible. Generally, the rabbit died from nephritis on the second day. Only one animal survived, which the author shewed to the Congress. The patches had retrogressed, and were replaced by intense white patches of degeneration, between which, here and there, pigmentation could be observed. These changes were in the superficial retinal layers.

Control experiments with normal dog serum caused no pathological changes, ocular or nephritic.

zur Nedden's experiments convinced him that there was a *specific* action of nephro-toxin upon the retina.

It is necessary to use a serum of exalted power, and to inject it into the carotid. Intravenous injection causes no, or at most very slight, nephritis.

A sketch of a section of the retina shews the degenerative changes in the nerve-fibre and ganglion-cell layers. zur Nedden thinks that owing to the specific cytotoxic changes in the connective tissue of the innermost retinal layers, an albuminous fluid is secreted, which separates the supporting fibres from each other. The œdematous patches appear too soon to be due to a secondary action following the nephritis.

There can be no doubt that there is a specific relationship between the inner retinal layers and the kidneys, in the sense that both possess in common certain albumen groups.

T. HARRISON BUTLER.

XI.—DACRYOCYSTORHINOSTOMY.

Schirmer, O.—On dacryocystorhinostomy after Toti's method. (Ueber die Dacryocystorhinostomy nach Toti.) *Zeitschrift für Augenheilkunde*, Dec., 1908.

Schirmer (Strasburg) is dissatisfied with the results of extirpation of the lacrymal sac, which in some cases leads to rather troublesome epiphora. Zimmernmann has suggested and practised the introduction of a silver tube to maintain the patency of the canal after extirpation, but Schirmer, who has seen some of the cases so treated, is not satisfied that the desired result has

been attained. He has tried Toti's operation in eight cases, and is so far satisfied that it cures the dacryocystitis and leaves a permanent drain into the nose. But he did not succeed in all cases in restoring the normal mechanism, for although fluid could be *syringed* through, fluorescein, instilled into the sac, did not naturally pass into the nose. Toti's operation is performed as follows: the usual incision is made, the periosteum is divided along the crista lacrymalis anterior, and the internal palpebral ligament detached. The periosteum with the sac is reflected as far as the posterior lacrymal crest, leaving the nasal sac wall and the lacrymal groove quite exposed and free. A large piece of the sac is excised, and a corresponding opening made in the lacrymal bone and nasal mucous membrane. A drain of iodoform gauze is passed through this orifice into the nostril, the sac replaced in its original position and the wound sutured. The opening generally leads directly into the nose just in front of the anterior end of the middle turbinal. Occasionally, a few ethmoid cells may interpose, but they are easily dealt with. It is advisable to plug the naso-pharynx during the operation. The opening in the bone is commenced with a sharp chisel, and completed with Grünwald's forceps. The drain remains *in situ* for five days, and is then removed from the nose.

T. HARRISON BUTLER.

XII.—ACUTE OPHTHALMIA IN THE EAST.

Butler, T. Harrison.—The clinical features, bacteriology, and treatment of acute ophthalmia in the East. *Royal London Ophthalmic Hospital Reports*, Vol. XVII, Part I.

The inhabitants of Egypt and Palestine suffer so much from eye diseases that probably not more than 10 per cent. of the population have sound eyes. In 1903 and 1904, 2,000 cases of leucoma adherens, staphyloma, and shrunken eyes came to the British Ophthalmic Hospital at Jerusalem, forming 15 per cent. of the new cases. Most of the damaged eyes were due to the annual summer epidemic of acute muco-purulent conjunctivitis; a small minority to trachoma and other diseases. Trachoma and acute muco-purulent conjunctivitis are two totally distinct diseases, and not acute and chronic stages of the same. The former may recover completely, leaving no sign of trachoma; the majority of cases of trachoma commence very insidiously, and for a long time cause no symptoms, but acute muco-purulent conjunctivitis may become very chronic and may last for months, and often true trachoma is grafted on it. Such conditions are frequently due to the gonococcus, and the cases have often been injudiciously cauterized with strong nitrate of silver.

In a period from January to July, the following organisms were found:—

Morax-Axenfeld diplobacillus	...	1	18·3 per cent.
Koch-Weeks' bacillus	...	...
Pneumococcus	...	...
Mixed Infection	...	16·7	"
Gonococcus	...	8·4	"
Sterile	...	20	"

These do not include ulcerative cases.

In the very chronic ophthalmia, the following were found :—

Mixed Infection	...	...	...	35	per cent.
Morax-Axenfeld	...	...	...	25	"
Gonococcus	...	...	...	15	"
Pneumococcus	}	...	...	5	"
Staphylococcus					
Sterile	...	...	...	15	"
Koch-Weeks'	...	...	...	0	"

During the Summer epidemic there were

Koch-Weeks'	...	...	...	66	"
Pneumococcus	...	...	...	22	"
Mixed Infection	...	...	...	6	"
Morax-Axenfeld	...	...	...	4	"
Gonococcus	...	...	...	0	"
Sterile	...	...	...	2	"

In cases of severe ulceration 40 per cent. were due to the gonococcus, and in slight ulceration mixed infections cause the greater number, *viz.* : 30·4 per cent.

60 per cent. of cases of acute and inflamed trachoma were sterile, half that number were mixed, and 10 per cent. were due to the pneumococcus. The Klebs-Loeffler bacillus was never found.

The acute epidemic ophthalmia commences in July, is at its height in August as regards numbers, but its virulence increases till November, and during November and December, the cases are much fewer in number but far more grave. In January it decreases and gradually falls until the following June.

The sufferers are generally children, and often babies. There is much overcrowding and dirt, and no sanitation among the Jews, and in spite of the heat, windows and doors are kept closed, and the mother's apron is usually the thing used to wipe all the children's eyes with unless they possess a handkerchief, which is used for everyone. Flies are also an important agent in dissemination of the disease.

Unless the greatest care is taken, doctors and nurses are almost sure to become affected. Of three nurses who got it, one recovered, one received permanent damage, and one lost an eye.

As regards prognosis, it is generally good in Koch-Weeks' cases if seen at once, and so also in the Morax-Axenfeld cases. The mixed cases are generally very chronic and resist treatment; and the gonococcal cases are always serious and the prognosis is very bad.

The symptoms and complications are next discussed. As regards treatment, protargol was found to be superior to argyrol, and argyrol and silver nitrate were found to have an equal action.*

A detailed description of the treatment is given.

C. DEVEREUX MARSHALL.

* A full account of these tests can be found in THE OPHTHALMOSCOPE for January, 1907, p. 14.

XIII.—THE NASAL ORIGIN OF SOME OCULAR AFFECTIONS.

Meyer, A.—The nasal causes of diseases of the lacrymal passages and of the conjunctiva, with their treatment (Nasale Ursachen und Behandlung der Erkrankungen der Tränenwege und der Bindehaut *Zeitschrift für Augenheilkunde*, Februar, 1909).

The symptomology of lacrymal disease is chiefly ocular, but its pathogenesis is largely nasal. **Meyer**, of Berlin, a rhinologist, has for three or four years examined cases of lacrymal disease from Gutmann's clinic. He has made notes of 88 cases. The symptoms were: In 65 cases, epiphora; in 1 case, blennorrhœa; in 1 case, fistula; in 3 cases, dacryocystitis and conjunctivitis; in 6 cases, blepharo-conjunctivitis; and in 7, keratitis with ulcer. The nasal examination resulted in the following: 7 cases, normal nose; 22 cases, deformity of the septum; adenoids and enlarged tonsils, 16 cases; in 13 cases the inferior turbinal was closely applied to the nasal wall, and in 12 cases was hypertrophied. In 9 cases there was sinus empyema; in 3 cases essential, and in 3 cases specific ozena.

The exciting cause is either mechanical, due to enlarged turbinals, deflected turbinals or septum, or it is inflammatory or specific.

The treatment may be purely ocular where no nasal cause is present, purely nasal, or more generally a combined treatment. Where the obstruction is due to abnormal turbinals, these must be treated, being cauterized, removed, or bent into correct position. Sinus disease must be treated in the usual way.

The paper is a most useful one, and shows how utterly foolish it is to attempt to treat a case of lacrymal disease without a careful examination of the nose, for, as the author points out, it often happens that when a mechanical obstruction at the lower end of the duct has been overcome, the lacrymal disease cures itself spontaneously. T. HARRISON BUTLER.

XIV.—SOME UNUSUAL FORMS OF KERATITIS.

- (1) **J. V. Paterson**,—A case of Reticular Opacity of the Cornea. (Gittrige Keratitis, Haab.) *Ophthalmic Review*, August, 1907.
- (2) **Kipp, Chas. J.**—A case of grill-like keratitis. *Trans. American Ophthalmological Society*, Vol. XI, Part III, 1908, p. 537.
- (3) **Paderstein, R**—On the pathology of nodular degeneration of the cornea. Zur Pathologie der knotchenförmigen Hornhaut-degeneration.) *Klin. Monatsbl. f. Augenheilkunde*, Februar, 1909.
- (4) **Hudson, A. C.**—A case of reticular keratitis. *Trans. Ophthalmological Society U.K.*, Vol. XXIX, Fasc. 1, 1909, p. 11.
- (5) **Folker, Herbert H.**—Nodular opacity of the cornea in three generations. *Ibidem*, p. 42.
- (6) **Zentmayer**.—Nodular opacities of the cornea *College of Physicians of Philadelphia*, February 18, 1909.

(1) **Paterson's** patient was a widow, aged 48 years, who had for 2½ years noticed a defect of the left eye. There was no history of any eye complaint in

the family, neither had the patient suffered from eye trouble in childhood or youth. The eye was not painful, but occasionally felt as if there was some grit in it. The eye was quite free from injection and other signs of irritation. On the left cornea, chiefly near the centre, a number of irregular, wavy, branching, and anastomosing grey lines were visible, forming an irregular meshwork. Towards the centre the lines were broader and tended to fuse, thus forming a considerable opacity, while there was a general haze in this situation. The lines were close beneath the epithelium, which was raised over them. The general haze consisted of fine grey dots, which were rather deeper. There was no sign of old or recent vascularisation. This form of opacity is very rare. Cases have been described by Haab and others, who look upon the disease as a degeneration rather than an inflammation. It generally progresses very slowly, but causes great deterioration of vision. Nothing is known of its pathology, but it frequently occurs in several members of the same family.

C. DEVEREUX MARSHALL.

(2) The case described by **Kipp** (Newark, N.Y.) resembles in many ways those of Fehr, Biber, Haab, Dimmer, Hauenschild, and Freund. The condition affected both the corneæ of a healthy man of 30 years. There was no history of a similar affection in the other members of the patient's family (five brothers and one sister). As shown by Fig. 1, each cornea, more

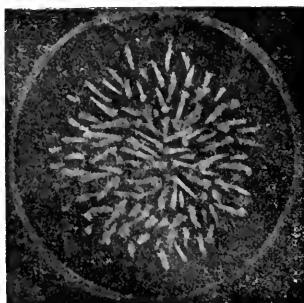


Fig. 1.

particularly in its central region, was the seat of small dots and opaque lines. The opacities were slightly raised, but the epithelial layer was intact and lustrous. The corneæ were sensitive. V. about $\frac{6}{12}$. The process was essentially chronic, the subjective symptoms were slight, and such treatment as was tried during the period of about two years he remained under Kipp's observation failed to effect any marked improvement. SYDNEY STEPHENSON.

3 Through the death of a patient affected with bilateral nodular opacity of the cornea, **Paderstein** (Berlin) was enabled to make a microscopical examination of the complete corneæ. The latter exhibited during life a finely granular surface, apart from the characteristic opacities. No other member of the family appears to have suffered from the same affection. The corneal tissue proper was found to be quite normal. The essential changes consisted in a hyaline substance between Bowman's membrane and epithelium. This substance had in some places a lamellar structure; in others it appeared in the

shape of nodular excrescences of Bowman's membrane, similar to the hyaline bodies of Bruch's membrane. On closer scrutiny, however, a hyaline degeneration of the deeper epithelial cells appeared to be the source of the substance which subsequently became deposited on Bowman's membrane.

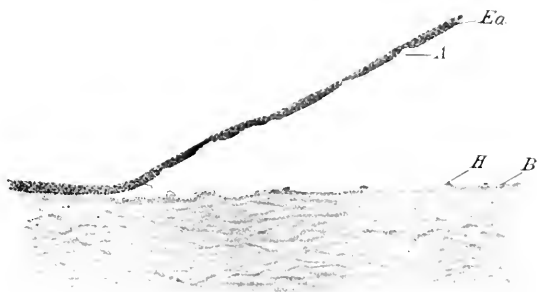


Fig. 2.

Above the nodules and corresponding to their shape, the epithelium was thinned, a picture again reminding one of the atrophy of the pigmentary epithelium above the hyaline formations of Bruch's membrane (*vide* figure 2, in which the epithelium has become partly detached by accident.)

C. MARKUS.

4) A woman, aged 48 years, was seen in 1905 with a peculiar condition of the cornea, and almost normal sight. Examined by Hudson (London) in 1908, the condition was as follows: the central two-thirds of each cornea was occupied by branching and anastomosing lines, somewhat resembling cobwebs (*see* figure 3). They occupied different levels, and, for the most part,



Fig. 3.

were nearer the anterior than the posterior surface of the cornea. The peripheral zone of each cornea was practically free from changes. Sensation un-

impaired. Vision (with correction) 6/36. Tension was full normal. The condition is spoken of as an instance of "reticular keratitis," of which the first description is stated to have been given in the year 1899 by E. T. Collins and O. Haab.

SYDNEY STEPHENSON.

(5) **Folker** (Hanley, Staffs.) examined 22 members of a family, amongst whom he found 9 instances of so-called nodular opacity of the cornea. The youngest patient was aged 12 and the oldest 92 years, the average age being 35·3 years. The heredity of the disease is clearly brought out in a pedigree of the family which is attached to the communication. The "tree" shows that the disease affected three generations comprising, in all, 27 members, of whom Folker examined the nine affected. As regards the characteristics of the ailment, three points may be mentioned: 1. the fact that it involved both eyes; 2. the absence of any elevation of the epithelium corresponding to the corneal deposits; and 3. the presence in the cornea of two of the patients of fine, lattice-like lines, in addition to the nodular opacities.

SYDNEY STEPHENSON.

(6) **Zentmayer** (Philadelphia) presented a patient with nodular opacities of the cornea. M.K., female, aged twenty-four years, single, poorly-nourished, and of low mentality. At the age of fourteen years, the patient had photophobia, lacrymation, and slight redness of eyes with failing vision. She was fitted for glasses at that time, but they did not improve vision.

Family history negative. Examination of the chest showed a high-pitched note and a loud systolic murmur at the base of the heart.

In both corneæ there are numerous grayish dense opacities easily visible with the naked eye, which on examination with the *loupe* are seen to present a great variety of form—rounded, triangular, but principally irregular. They vary in size from 0·5 to 1·5 mm. They are grouped in a somewhat oval area, the upper border of which is just above the centre of the cornea and the lower border on a line with the margin of the lower lid, the whole being lengthened out in the palpebral fissure. There is a tendency for the opacities to arrange themselves into curved lines, and in the left eye they form a distinct whorl. The entire cornea, except the extreme margin, is hazed through the presence of dust-like opacities. The larger opacities are mostly immediately beneath the epithelium, which is elevated, thereby giving to the surface of the cornea an irregular but unbroken surface. The fine opacities occupy deeper layers. The eye is free from congestion, and there are no evidences of past inflammation. The sensibility of the cornea is diminished. V. O. D. = 5/25; V. O. S. = 5/200. There was constitutional but no local reaction to tuberculin. Microscopic examination of scrapings from one of the nodes showed a material resembling hyalin.

T. B. HOLLOWAY.

XV.—MISCELLANEOUS.

Hirschberg, J. and Ginsberg, S.—A rare case of simple increase of tension lasting 20 years, with anatomical examination. (Ein seltner Fall von einfacher Drucksteigerung, nach 20 jährigem Bestande anatomisch untersucht.) *Centralbl. f. prak. Augenheilkunde*, Januar, 1907.

The fact that simple chronic glaucoma is of the same nature as the inflammatory and hæmorrhagic types, and that the simple form may be converted into one of the other forms, is well illustrated by an unusual

case reported by **Hirschberg** (Berlin) and **Ginsberg** (Berlin). In 1886 they saw for the first time a young girl, aged 23, whose left eye had become blind during the preceding two months. The right eye had a deep physiological excavation, V. 15/20, and normal field, T.n. The left eye outwardly normal. T. +1 2. V.=hand movements. Deep glaucomatous excavation of disc. Eserin drops were ordered and the patient came every month or two to be examined. The reaction to eserin was good, and the condition remained the same. In 1897 the attempt was made to discontinue the eserin, but severe frontal headaches came on and the drops were resumed. In 1905 the left eye became somewhat hard, and the eserin, after having been used constantly for 19 years, began to lose its effect. The pupil did not contract well, the cornea became oedematous, the conjunctival veins became dilated, and in June, 1906, the picture was one of acute inflammatory glaucoma, with very high tension, dilated pupil, muddy media, and circumcorneal injection. The eye was enucleated. Microscopically, the eye was found to be typically glaucomatous—with some slight sclerosis of the arteries.

A. LEVY.

Hirschberg, J., and Ginsberg, S.—A case of metastatic ophthalmia with anatomical examination. Ein Fall von metastatischer Augen-Entzündung mit anatomischer Untersuchung.) (*Centralbl. f. prak. Augenheilkunde*, Februar, 1907.

Hirschberg (Berlin) and **Ginsberg** (Berlin) report a case of septic polyarthritis in which ten days after the onset of the illness, the left eye was found to be affected, and in the course of the following two weeks became totally blind, and on examination, the vitreous was found to be occupied by a white mass with spots of hemorrhage. The eye was soft, somewhat reddened, and tender. The eye remained irritable and was excised. The patient recovered completely and the right eye remained normal.

On microscopical examination, the seat of the inflammation was found to be in the pars plana of the ciliary body, and the optic nerve was also found to be diffusely infiltrated. The choroid showed a few miliary abscesses.

A. LEVY.

Parisotti.—Some points in toxic amblyopia (*Considerazioni sulla ambliopia tossica.*) *Rivista Italiana di Ottalmologia*, March-May, 1907.

Parisotti has noticed that almost all sufferers from toxic amblyopia are hypermetropic, and regards it as a favouring, although not an essential, condition.

HAROLD GRIMSDALE.

Marquez.—A remarkable case of subluxation of both lenses. A new form of strabismus (Caso notable de subluxacion de ambos cristalinios y de una nueva forma de estrabismo.) *Archiv. de Otol. Hisp-Amer.*, August, 1907.

The patient had suffered for many years from subluxation of both lenses, and had undergone double iridectomy for the relief of his defective vision. The abnormal position of the lenses caused deviation of the optical and visual axes and a consequent strabismus.

HAROLD GRIMSDALE.

Hilbert, R.—A case of coloured scotoma. (Ein Fall von farbigem Skotom.) *Centralbl. f. prak. Augenheilkunde*, Mai, 1907.

The cases of scotoma which appear to the patient to be coloured are exceedingly rare, only 17 having been reported, and Hilbert (Sensburg), now adds another case. The patient, a man of 50, complained of failing vision in the left eye for some years, but he saw somewhat better eccentrically than directly, and in artificial light the central part of the field of vision appeared to him to be of a yellow colour which was transparent or translucent. This left eye had a myopia of 3 D. and V. = 2 60, with optic atrophy and small blood vessels. The condition was one of old retino-choroiditis with central scotoma. The colouration was probably due in these cases to the shadow cast by the thickened retina. In others a definite reason for the colouration can be found, such as a small hæmorrhage, etc. The peculiarity in this case was the apparent translucency of the scotoma, a feature not noticed in any other case.

A. LEVY.

Goldberg, Hugo.—Pigment granules on the posterior surface of the cornea. (Pigment Körperchen an der Hornhauthinterfläche.) *Arch. f. Augenheilk.*, Oktober, 1907, p. 324.

Goldberg has discovered that a large number of people present pigment granules upon the posterior surface of the cornea. The condition is more frequent among older people, and is more often found in persons with light eyes than in those with dark eyes. The colour of the pigment corresponds to that of the iris. The granules are mostly situated opposite the lower margin of the pupil, they are never larger than 9μ , and generally number 3-4, sometimes 1-2, more rarely 5-6. Occasionally, however, they occur in large numbers, and then they are associated with a particular form of cataract, the only pathological condition with which the granules have been observed to have any connection. The cataract is a white, soft one, maturing rapidly, and in consequence much in advance of the cataract in the other eye, when both eyes are cataractous.

PERCIVAL J. HAY.

Snell, Simeon.—A lecture on wounds and injuries of the eyeball, eyelids, and orbit. *British Medical Journal*, 7th December, 1907.

Snell's lecture is, in essence, a summary of present-day practice, addressed to post-graduate students. It deals with wounds of the optic nerve, blows on the eye and face, injuries of the cornea, scleral wounds, foreign bodies, and sympathetic ophthalmitis. There is one point that may not yet be known to all ophthalmic surgeons (which was brought forward by the author at a meeting of the Ophthalmological Society on 14th June, 1906), viz., that all steels are not magnetic. Manganese steel is not magnetic; chrome steel is less magnetic than ordinary steel; the addition of a small quantity of manganese to the magnetic nickel steel renders it non-magnetic, etc. The reader cannot do better than refer to Snell's article in the *Transactions* of the Ophthalmological Society for full particulars on this subject, which is of direct daily interest to all who practise in manufacturing cities.

ERNEST THOMSON

Henderson, E. E., and Lane-Clayton, Janet E.—Study of the ciliary epithelium after puncture of the anterior chamber. *Royal London Ophthalmic Hospital Reports*, Vol. 17, Part I.

It is now generally admitted that the source of the aqueous is the ciliary body and its processes: that is, its epithelium. It may be a mere filtration or an active secretion. Henderson and Starling have shown experimentally that filtration would account for it, although this does not negative the possibility of a secretory mechanism, since some of the constituents of the fluid may be derived from the activity of the epithelium, quite apart from the actual fluid formed by filtration. In addition, there is a marked difference between the intra-ocular fluids and the blood-plasma. Normal aqueous contains only a trace of proteid, whereas that which quickly comes to fill up the anterior chamber, after tapping, may contain as much as 5 per cent. and have the power of coagulating spontaneously. In the research here recorded by **Henderson** (London) and **Lane-Clayton** (Wheathampstead), albino rabbits were used when under the influence of an anæsthetic. The anterior chamber was drained for from 20 minutes to 1½ hours in one eye, the animal was then killed, and the eyes excised, compared, and examined microscopically.

Certain changes were noticed after drainage, which are figured in three photomicrographs, showing the normal and the abnormal condition after the operation. The most striking change in the "operated eye" was a streaming away of albuminous material from the outermost cells of the epithelium, some of which were partially disintegrated and appeared to be giving rise to this albuminous material. These changes appear to be due to an alteration in the protoplasm of the cell and apparently not to a true secretion, but rather tending to degeneration. Hence, normally when the intra-ocular pressure is maintained, the process of production of the intra-ocular fluid is probably one of filtration, but rapid changes in pressure bring about disintegration of the epithelial cells, leading to changes in the fluid produced, and causing coagulation.

C. DEVEREUX MARSHALL.

Steiner, L.—Migration of the ink in a tattooed leucoma. (Wanderung der Tusche in einem tätowierten Leukom.) *Centralbl. f. prak. Augenheilkunde*, April, 1908.

That the ink in a tattooed cornea may wander is well-known, but **Steiner** (Surabaya, Java) has had the opportunity of observing a case in which the whole process could be observed. He had tattooed a dense leucoma twice, and each time the reaction was slight, and the result good. After the third sitting the reaction, however, was much more marked. A zone of infiltration formed in the centre of the tattooed area and towards this spot all the pigment migrated, so that in the course of a few days it became intensely black, leaving the whole of the surrounding area denuded of pigment except for a few particles at the extreme periphery. The inflammation gradually subsided, and later on, another attempt was made to tattoo the remaining portion of the leucoma, with an entirely successful result.

A. LEVY.

Rhoads, J. N.—Two anomalous winking cases. *Ophthalmic Record*, August, 1908.

Rhoads (Philadelphia) reports the cases of two patients in whom the alar nasi dilated every time the individual winked.

Hancock, Ilbert.—Head-nodding and nystagmus. *Royal London Ophthalmic Hospital Reports*, Vol 17, Part I.

According to **Hancock** (London), there are two distinct groups of cases in which associated movements of the head and eyes are the prominent, if not the only, symptoms of disease: (1) spasmus nutans; (2) cases of congenital head-nodding and nystagmus persisting throughout life.

The remarks on the first group are based on ten cases which the author has seen, and they are divided into three groups: (*a*) antero-posterior (assenting nodding), (*b*) rotatory (negation nodding), (*c*) lateral (or side-to-side nodding).

The nodding is often an early and transitory symptom, which usually precedes the nystagmus, which is generally of the same variety in the two eyes, although it may be mixed. It is essentially a disease of infancy, and the onset in this series varied from 4-12 months. Females were far more liable to it than males. Nothing otherwise abnormal could be discovered in any of the eyes; they were all hypermetropes, varying from 2-6 D., and there was nothing to suggest that the vision was not perfect. The nystagmus apparently not worrying the little patients in the very least. Usually, the condition had entirely disappeared by the third year, and in many before this. As a rule, the head-nodding disappeared long before the nystagmus.

Two of Hancock's cases had well marked skeletal rickets, three had night sweats, delayed dentition, and gastro-intestinal irritation, and the remaining four had no signs whatever of the disease. There was no history of injury in any case. He is altogether opposed to the idea that deficient illumination is the cause of it, as has been maintained by some, and he is more inclined to think that it has its origin in some abnormal condition of the semi-circular canals. Little is really known of the pathology of the disease, and the innumerable theories are all entirely speculative. He then compares group 2 of congenital head nodding and nystagmus; this is present at birth, and persists throughout life, and is quite a distinct condition from group 1 of spasmus nutans.

C. DEVEREUX MARSHALL.

Puccioni.—A contribution to the pathogenesis of traumatic and congenital cysts of the iris. (*Contributo alla patogenesi dello cisti traumatiche e congenite dell'iride.*) *La Clinica Oculistica*, May, 1908.

Puccioni's study is very interesting; the first case, the traumatic cyst presents the usual features of these not uncommon inclusion cysts; the second case, however, the congenital cyst of the iris is an example of a very rare ophthalmic condition. The author has been able to discover only four others recorded. The patient was aged 9 months, and the cyst, growing from the lower part of the iris, filled the lower-third of the pupil. It was removed by an infero-external incision. Microscopical examination of the series of sections made from the cyst, showed that it had two parts, one near the anterior surface of the iris, and the other near the posterior surface, which were connected by a narrow canal. Both loculi and the connecting canal were lined by stratified epithelium. This epithelium was made up of cells of irregular outline, having a large nucleus. They rested on the iris without any basement membrane.

Puccioni refers to an article by Gallemaerts in the last volume of the *Bulletin* of the French Ophthalmological Society, and concludes that the congenital cyst is probably connected with the margin of the secondary optic vesicle. It is not possible definitely to affirm that the cyst sprang from the

annular sinus of Szili, which was not completely obliterated, but there can be no doubt, Puccioni thinks, that it originated from an aberrant fragment of the inner layer of the secondary optic vesicle. It is therefore of indirect ectodermic origin, being derived from the retinal epithelium.

HAROLD GRIMSDALE.

Antonelli, A.—Persistence of the action of atropine in superficial injuries of the eye. *Persistance de l'action de l'atropine dans des traumatismes superficiels de l'œil.* *Recueil d'Ophthalmologie*, juin, 1908.

Antonelli (Paris) records two cases in which the instillation of a drop of atropine solution, after extraction of a foreign body from the cornea, was followed by a persistent mydriasis, lasting six months in one case and two months in the other. Instillation of eserine, and the application of a continuous electrical current, produced only a partial and temporary diminution of the mydriasis, which was associated with considerable discomfort in the eye.

The author was careful to eliminate hysteria in simulation, and concludes that the mydriasis was owing to a true internal ophthalmoplegia of local peripheral origin due to an exceptional, persistent, and powerful toxic effect of the alkaloid, adding that it is necessary to admit an idiosyncrasy on the part of the patient. He points out that, as a rule, it is quite unnecessary to use atropine in these cases, and that the use of a 2-3 per cent. solution of cocaine every three or four hours will relieve signs of threatened iritis, such as pericorneal injection, irritative myosis, and ciliary spasm.

J. JAMESON EVANS.

Golesceano, C.—Progressive papillary atrophy after extraction of cataract. (*Atrophies progressives de la papille après l'extraction de la cataracte.*) *Recueil d'Ophthalmologie*, juin, 1908; *La Clinique Ophthalmologique*, 10 septembre, 1908, and *l'Ophthalmologie Praticienne*, septembre, 1908.

Golesceano (Paris) points out that in old people after the extraction of cataract without complication, with satisfactory visual results, a progressive optic atrophy may appear after some years and reduce vision to such an extent that the patients can hardly get about. The author records five cases, varying in age from 76 to 66, in which cataracts were successfully extracted and whose vision with correction varied from $\frac{1}{2}$ to $\frac{1}{4}$. Three to five years later, papillary atrophy with reduction of vision to $\frac{1}{16}$ or less; retraction of the fields; and generally some narrowing of the retinal arteries made their appearance. The pupillary area, media, and fundi were otherwise practically normal, and there was no serious impairment of general health. There was entire absence of any extreme error of refraction, simple or chronic glaucoma, and of renal or hepatic insufficiency.

There is no evident explanation of the cause of the atrophy, but retinal arteriosclerosis is possible, although there was no definite evidence of it in these cases.

J. JAMESON EVANS.

Goerlitz, Martin.—On dacryoadenitis and dacryops. *Ueber Dakryoadenitis und Dakryops.* *Klin. Monatsbl. f. Augenheilkunde*, October, 1908.

Goerlitz observed a very hard swelling of both lacrimal glands in a middle-aged man who had suffered from a feverish cold a few weeks before the onset

of the gland affection. The latter developed very gradually without any acute manifestations. There was no history of syphilis. The swellings disappeared in the course of several months, during which the patient was put on potassium iodide. After a full consideration of the various conditions leading to enlargement of the lacrymal glands, such as new growths, mumps, tubercle, syphilis, leukaemia, pseudo-leukaemia, and Mikulicz's syndrome, the author arrives at the conclusion that the present case was one of inflammation, produced by the toxins of influenza bacilli.

A man who had received a severe cut of the left upper eyelid, some time previously, exhibited a cystic swelling above the tarsus of the size of a pea, and connected with the upper-outer angle of the orbital margin by scar-tissue. The tumour, and, with it, the lacrymal gland, were excised and submitted to microscopical examination. The cyst was lined with double layer of columnar epithelium, in which goblet cells were interspersed. The theory is that through cicatricial changes following the injury, an isolated duct became occluded and by continued secretion from the duct-cells distended, thus giving rise to dacryops.

C. MARKUS.

BOOK NOTICES.

University of London, Francis Galton Laboratory for National Eugenics. *Eugenics Laboratory Memoirs, V. A first study of the inheritance of vision and of the relative influence of heredity and environment on sight.* By AMY BARRINGTON and KARL PEARSON, F.R.S. London: Dulau & Co., 37, Soho Square, W. 1909. Price, 4s.

Perhaps some of our readers may not be aware that a laboratory has been lately established in the University of London, named The Francis Galton Laboratory for National Eugenics. The object of the institution is to investigate the conditions that are favourable to the development and maintenance of a healthy state of the mind and body, and to act as a storehouse for statistical material bearing on the mental and physical conditions in man, and the relation of these conditions to inheritance and environment. Several important memoirs have already been published, dealing with the pedigrees of diabetes, split-foot, polydactyly, tuberculosis, deaf-mutism, trophodema, and legal ability. The present memoir is the fifth of the series.

In seeking to determine the influence of heredity and environment on vision, the authors of the memoir before us find that, although a large number of data are to be gathered from works on ophthalmology, these are wholly unreduced from the standpoint of modern statistics. The observations made and recorded by ophthalmic surgeons seem to point to the existence of some hereditary influence. Swanzy and Werner, writing in 1907, state, with regard to myopia, that "heredity also plays a certain part, which, however, is not quite clear, but it would seem some anatomical or constitutional predisposition must be transmitted to the off-spring," and Mr. J. Herbert Parsons, after citing from a large number of observers the percentages of myopia in one or both parents of myopes, observes that "analysis of these statistics leads to the conclusion that only 10 per cent. show hereditary influence, which is too small

a number to be decisive, considering the numerous factors which are now taken into account." The authors remark upon this that no such percentage statistics can possibly settle the problem of the intensity of inheritance. The distribution of parents of the normal and the proportion of myopes to normal in the general population must be found before any appreciation of the effect of heredity can be made. Parsons has further pointed out that myopia is not due to a single cause, that there are varieties, and it is possible that some of these varieties are hereditary, and that others are due to environmental conditions.

The general conclusions arrived at by the authors, in regard to the inheritance of corneal astigmatism, are that this condition is certainly inherited, although the material is neither sufficient nor adequately classified to permit the accurate value of the inheritance co-efficients to be determined, but it seems certain that girls are more astigmatic than boys, and probably more variably. In both cases there is possibly a slight reduction of astigmatism with age. In regard to corneal refraction, they find that it is inherited, and inherited at the same rate as other physical characters in man.

There appears to be a close relationship between refraction and keenness of vision in both sexes, although in girls it may be slightly less than in boys. A diagram is given showing how much more influence myopia has on keenness of vision than hypermetropia.

In regard to the relation between corneal refraction and age, it is well known that young children are hypermetropic, and tend with age to become emmetropic, or occasionally myopic. Some statistics, with which, however, others are not in accord, seem to show that between 6 and 15 years of age, practically every form of eye defect increases, especially the hypermetropia, and the authors venture to think that whilst there is not the least doubt of a sensible relationship of age to each of the several categories of eye defect, yet the problem of the nature of this age relationship has not at present been properly worked out. Accurate researches are still required to enable us to determine how far, first, simple growth, and, secondly, environment, and especially school environment, affect the refractive power of the eyes. Statistics contributed by Edinburgh observers seem to show that school life, taking the range from 5 to 15 years, does not increase the total amount of defective sight. The Glasgow data show that they do.

The authors observe that whilst many writers assume that the well-known statistics of Cohn demonstrate that school is the hot-bed for the production of myopia, they do not really do so. They only seem to indicate that the moderate association they exhibit between school environment and degree of myopia is solely a secondary result of a primary relation between age and degree of myopia.

With regard to the influence of environment—that is, of house environment—on sight, the points to which the authors directed their attention as possibly affecting sight were the number of people per room of the house; the economic condition of the house; the good or bad health of the parents, as, for example, the presence of chronic alcoholism or of tuberculosis; and the moral condition of the parents.

The complexity of the conditions and the slenderness of the data from which conclusions are drawn are great, but the general results of the enquiry are summed up by the writers in the following statements. "There is no evidence whatever that our crowded, poverty-stricken homes, our physically ill-conditioned, or immoral parentages are *markedly* detrimental to the children's eyesight. There is no sufficient or definite evidence that school environment has a deleterious effect on eyesight of the children. It is certain that

changes of vision do take place during school years, consisting first in a decrease in the hypermetropic classes, and an increase in the emmetropic class. This is followed between 10 and 14 by a decrease in the emmetropic class, and an increase in the hypermetropic, astigmatic, and myopic classes, the balance being still in favour of emmetropia when school is left. Is the first a growth law and the second an environmental effect, they ask, or are both but phases of the law of growth, a passage from hypermetropia to emmetropia and myopia of the eyes of unstable stocks, this last being a probably correct solution because so many hypermetropes have myopic siblings older than themselves.

Refraction and keenness of vision are inherited characters, and the degree of correlation between the eyesight of pairs of relatives is of a wholly different order from the correlation of eyesight with home environment. There is sufficient evidence to show that intelligence, as judged by the teacher, is correlated with vision in a moderate manner, but not enough to prove that if the source of poor vision were removed the intelligence would reach a higher stage.

The outcome of the whole enquiry is that if attention be paid to the breeding, the environmental element will not upset your projects, but, on the contrary, improve the environment to the utmost, and breeding will lay low your schemes. The essential point is to get good stock, and the environment will keep it in good condition.

HENRY POWER

La Ponction, Lombar en Ophtalmologie. Lumbar Puncture in Ophthalmology. By A. G. SOING. Bordeaux: Destout Ainé et Cie. 1907. Pp. 64.

Soing's thesis on lumbar puncture in ophthalmic practice begins with a historical survey of the subject. Leonard Corning, of New York, is credited with having first proposed the operation in 1885, and Gernicke with having first performed it in 1891. A considerable number of authors are mentioned who have contributed papers on the question of lumbar puncture—with but one or two exceptions all of them are French. The *technique* of the operation is discussed; preference is given to the recumbent position of the patient. After a brief chapter on the microscopic and cytological examination of the cerebro-spinal fluid, the author goes on to deal with the diagnostic and therapeutic value of the operation. He thinks very highly of it as a method of diagnosis, more particularly in tuberculous and syphilitic affections of a subacute and chronic character. In both of these conditions the cerebro-spinal fluid contains a large number of lymphocytes, but while they are constantly present in tuberculous affections of the meninges, etc., they may be absent in the later stages of syphilis, especially when appropriate treatment has been carried out for some time. This being so it is possible to use lumbar puncture as a means of differential diagnosis. Again, in recent cases of meningitis lymphocytosis may be accepted as evidence in favour of a syphilitic infection in the absence of tuberculous lesions elsewhere. With regard to treatment Soing prefers lumbar puncture to craniectomy, and recommends it in all cases where the intracranial tension is raised, including cerebral and cerebellar tumours, cranial injuries, congenital hydrocephalus, uræmia, etc. He appears to be unacquainted with the work of Horsley, Cushing, Kocher, and others. The paper concludes with abstracts of thirteen cases recorded by various authors in which lumbar puncture was performed and upon the results of which the writer has largely based his opinions. They include serous meningitis, tuberculous meningitis

(2 cases, syphilitic meningitis (2, fall on head, ophthalmoplegic migraine 2), tabes (2), cerebral tumour, syphilitic optic neuritis, and neuro-retinitis of unknown origin. It may be of interest to note, that in the cases of ophthalmoplegic migraine and syphilitic optic neuritis there was no lymphocytosis.

PERCIVAL J. HAY.

Retinitis Pigmentosa with an analysis of seventeen cases occurring in deaf mutes. BY WILLIAM T. SHOEMAKER, PHILADELPHIA. Laboratory examinations of the Blood and Urine, by JOHN M. SWAN, PHILADELPHIA. Philadelphia: J. B. Lippincott Company. 1909. Price 8s. 6d. net.

This attractive-looking volume contains Dr. William T. Shoemaker's Essay on Retinitis Pigmentosa, to which was awarded the Alvarenga Prize of the College of Physicians of Philadelphia in July, 1908. The book is illustrated with three beautiful coloured plates of the fundus in retinitis pigmentosa, as well as with numerous text figures.

An introductory chapter of Dr. Shoemaker's book describes the history and the anatomical-pathological characteristics of retinitis pigmentosa. The conclusions are reached that the condition in question is not an inflammation, but that it represents a degeneration of the entire neuro-vascular tract of the peripheral end-organ of sight, extending beyond the orbit into the brain. The choroid is the first part of the eyeball to be involved, and the retinal changes are, for the most part, secondary.

Then follows a chapter on the symptomatology of the affection, which is congenital in origin, however late its manifestations come to light. The author doubts if one-sided retinitis pigmentosa can "ultimately maintain that distinction." He has never succeeded in finding a ring scotoma in such of his cases, thirteen in number, where it was possible to map out the visual fields with accuracy. Shoemaker, therefore, thinks further confirmation to be necessary before it can be stated that ring scotoma occurs in most, if not in all, cases of retinitis pigmentosa (Hancock). After enumerating the theories of ring scotoma, he concludes that each of them is "open to objection so forcible that the pathogenesis of this phenomenon must still remain in question." Shoemaker considers that retinitis pigmentosa sine pigmento is identical with retinitis pigmentosa, and that all such cases ultimately develop pigment in the retina. As to the ophthalmoscopic appearances of retinitis pigmentosa, Shoemaker suggests that the short lines of pigment, not infrequent in these cases, probably represent the position of vessels too small to be recognised as such, or else of vessels the lumen of which is packed with pigment. Another suggestion is to the effect that the white spots, now and then seen towards the periphery of the fundus, represent depigmented cells in the retinal epithelium, which do not happen to be backed by sufficient choroidal pigment to preclude the sclera from shining through.

A chapter is devoted to the aetiology of this mysterious disease. The fact is generally accepted that retinitis pigmentosa is relatively more common in the male than in the female sex. But this is disputed by Shoemaker, on the ground that of his seventeen cases, four were in males and thirteen were in females. His figures, however, are too small to justify the statement he makes, speaking of the male predisposition to the disease, namely: "our statistics show unequivocally the reverse." Under these circumstances, it is surely a misapplication of the statistical method to say that of his own cases "76.4 per cent. were females" and, furthermore, to italicise those words.

Heredity is a potent aetiological factor, although the direct transmission from parent to offspring is rare. With regard to consanguinity, that is more or less inseparable from heredity. It thus becomes impossible to determine whether consanguinity is in itself a cause of congenital defect, or whether it operates through the intensified transmission of hereditary tendencies prevalent in a family, the so-called "convergent heredity" of some writers. Maternal impressionism cannot be excluded as a factor; but with regard to syphilis, Shoemaker believes that its influence as a cause of true retinitis pigmentosa has not been established.

Chapter IV is given up to a detailed account of seventeen cases of retinitis pigmentosa met with in deaf-mutes, and the next chapter to a summary of these cases. The visual fields were plotted out in thirteen of the cases, and Shoemaker has drawn the following conclusions from a study of the facts thereby brought to light :- 1. In retinitis pigmentosa the form-field suffers greater and more rapid contraction than the colour-fields. 2. The fields tend to become *circular* around the fixation point. 3. Colour perception is well maintained, even in the presence of the most extensive atrophy and degeneration. 4. Ring scotoma must be a rare defect in this disease.

Elaborate investigations into the condition of the blood and urine were made in a number of the cases, but the results do not appear to have justified the trouble taken. As the author remarks, "no light can be thrown on the nature of the disease, and no assistance on its diagnosis given, by the examination of either of these body fluids."

As regards prognosis and treatment, no new points are brought out. The employment of animal extracts, as "Optocine," is not mentioned. Shoemaker's advice as to the medical direction of patients suffering from retinitis pigmentosa is marked by sound common-sense. He recommends that a mastery should be obtained, while sight still remains, of one or more of the several systems of reading for the blind, and he commends the perusal of Javal's *Entre Aveugles* to the patients. He is opposed to prohibitive legislation in the matter of the marriage of those with retinitis pigmentosa and kindred diseases. Statistics show, according to him, that while transmission to the next generation is rare, the appearance of the disease in subsequent generations is common.

Dr. Shoemaker's useful but by no means exhaustive monograph concludes with a bibliography, which might with advantage be amplified.

Text-blunders are few and far between. "Pettelsohn," on p. 9, should be "Peltelsohn," "Priestly Smith," on p. 33, should be "Priestley Smith," and "fraternity," on p. 26, should read "paternity." SYDNEY STEPHENSON.

CORRESPONDENCE.

[While *The Ophthalmoscope* will at all times welcome correspondence from its readers, the Editor does not hold himself responsible for any views expressed in this column.]

THE NOTIFICATION OF OPHTHALMIA NEONATORUM.

To the Editor of THE OPHTHALMOSCOPE.

SIR,

In the "Notes and Echoes" of the April number of *THE OPHTHALMOSCOPE* reference is made to the notification of the ophthalmia neonatorum cases seen at the Manchester Royal Eye Hospital to the Manchester Midwives Supervising Medical Sub-Committee.

The history of its adoption may be of interest.

During the years 1906 and 1907 I was engaged on some research work concerning the aetiology and prophylaxis of ophthalmia neonatorum, and, in a definite group of cases, I carefully investigated not only the ocular inflammation but also the condition of the generative organs of the mother and the prophylaxis employed at the time of confinement.

The results obtained were published in the *Ophthalmic Review* of December, 1908. To make my investigations as complete as possible, I discussed the matter with Dr. Fletcher Shaw, who was at that time resident surgical officer to the St. Mary's Hospital, Manchester. He kindly undertook the examination of the mothers and also instructed the hospital midwives in the Manchester districts to send all their cases of ophthalmia neonatorum to me at the Manchester Royal Eye Hospital, and, in addition, to make a careful note of the prophylaxis they had employed.

The result was excellent, for not only did I have the opportunity of treating the eyes from the onset of the inflammation, but as a result of such early treatment, not a single eye was lost during twelve months. In addition, there was an appreciable diminution in the number of cases of this disease.

After making such observations, I discussed the question with Dr. Margaret M. Smith, the executive officer of the Manchester Midwives Supervising Committee, and she, noting the advantages to be gained from such early treatment, and especially the working arrangement between the midwives and the hospitals, brought the subject to the notice of Dr. Niven, the Medical Officer of Health for the City.

As a consequence, the conference was held, and notification adopted.

I am, Sir,

Yours faithfully,

JOHN WHARTON.

21, St. JOHN STREET, MANCHESTER.

April 6, 1909.

THE ARTIFICIAL SPECTRUM TOP.

To the Editor of THE OPHTHALMOSCOPE.

SIR,

Allow me to correct a mistake on line 15 of the paragraph on Colour-Vision Theories, page 216 of *THE OPHTHALMOSCOPE*. For "white arc" read "black arc."

With reference to Dr. Edridge-Green's letter in the April number, I might say many things, but I will content myself with one or two.

I am not aware that an explanation of the colours has been given by any physicist; the colours are purely physiological not physical. As Dr. Edridge-

Green confesses that he did not hear my paper, and as he could not have seen any fuller account than was given in this journal, his suggestions that he completely understands my explanation would appear unwarrantable, indeed, a little more care in reading the note in the April number of THE OPHTHALMOSCOPE would have obviated some of his inaccuracies. Further study of the phenomena would show Dr. Edridge-Green that when the arcs are made broad, the colours are only seen at the margins of the curved black bands. This indicates that irradiation is a very important factor in the appearance of all the colours, and not only in the case of the blue colour as Dr. Edridge-Green suggests, though why the colour should be blue and not green is quite inexplicable on his theory. The greenish tint of the white portion of the disc is a personal peculiarity and has certainly not been noticed by any person to whom I have shown the top, even when attention is directly called to the point, and a comparison is made with a sheet of white paper.

I am, Sir,

Faithfully yours,

A. S. PERCIVAL.

NEWCASTLE-ON-TYNE.

NOTES AND ECHOES.

Deaths.

DEATH has been busy in our ranks of late, two prominent English ophthalmic surgeons, Simeon Snell, of Sheffield, and Charles Bell Taylor, of Nottingham, having joined the great majority.

Simeon Snell, that indefatigable worker and cheerful soul, whose death occurred on April 17th, may be said to have succumbed to the cares of office, since at the time of his demise he occupied a position never before filled by an ophthalmic surgeon, namely, that of President of the British Medical Association. A west countryman, he was born in October, 1851, near Launceston, and to the last he had a *pied à terre* at Teignmouth in his native county. He came from a medical family. His preliminary education was received at Mannamoad School, Plymouth, and his medical training at Leeds, Guy's Hospital, and the Royal London Ophthalmic Hospital. Soon after he became qualified, Snell settled in Sheffield, where for some years he lectured on anatomy at the medical school. Eventually, in 1874, he was appointed ophthalmic surgeon to the Sheffield Royal Infirmary, a post he retained to the time of his death. The resources of that great manufacturing city Sheffield and its surrounding coal-fields afforded almost unlimited scope for Snell's abounding energy. His work, especially upon industrial diseases and injuries of the eye, soon became known the world over. His work upon miners' nystagmus became classical. He was, without doubt, the leading authority in this country upon such subjects as the extraction of foreign bodies from the eye by means of the electro-magnet, and the prevention of accidents liable to occur in trades. A communication upon the causes of blindness amongst the inmates of the Sheffield School for the Blind, read in the section of ophthalmology at the Exeter meeting, 1907, led to the appointment of a Committee on Ophthalmia Neonatorum by the Council of the British Medical Association.

An energetic worker, Snell never hesitated to place his experiences upon record, and a complete list of his published contributions would extend to considerable length. Indeed, there was scarcely a practical subject to which

he did not make a more or less weighty contribution. It was in recognition of this fact that the Middlemore Prize was awarded to Mr. Snell by the Council of the British Medical Association as recently as last year. Snell's energies, however, were by no means bounded by ophthalmology. He took a large and important share in the public life of his adopted town. He was a justice of the peace for Sheffield. He took a leading part in obtaining a charter for the founding of the Sheffield University, where he was professor of ophthalmic medicine and surgery. As an author, Snell did not confine himself to strictly professional subjects. He contributed papers to the Sheffield Literary and Philosophical Society (of which he was for many years the honorary secretary and afterwards the president), and, in conjunction with the late Mr. J. D. Leader, wrote the *History of Sheffield Royal Infirmary*. At one time Snell edited the *Quarterly Medical Journal*. He was an original subscriber and a frequent contributor to the columns of THE OPHTHALMOSCOPE. Snell was vice-president of the Ophthalmological Society of the United Kingdom from 1892 to 1895, and a



SIMON SELL

member of the Council from 1884 to 1887. Snell possessed a most attractive and happy personality—he was at once straightforward “jannock” in the northern dialect), breezy, strenuous, and capable. Few men crammed more into their time than did the man whose memory will for long remain green amongst those who enjoyed the pleasure of his acquaintance. The place occupied by Snell in the scientific, academic, and literary life of Sheffield will be difficult to fill, if, indeed, it can be filled. The funeral took place on April 21st at Fulwood, when there was a remarkable tribute to the esteem in which the deceased was held. The service was conducted by the Bishop of Sheffield and the Vicar of Fulwood. The British Medical Association, as well as the Sheffield Royal Infirmary, the Sheffield University, the Sheffield Medico-Chirurgical Society, and other organisations with which Snell was connected, was represented at the funeral, which had quite a public character. Mr. Snell leaves a wife, two sons, and three daughters, to whom we offer our respectful sympathy.

The following appreciation of SIMEON SNELL has been furnished to us by Mr. PRIDGIN TEALE, F.R.S.:—

The late Simeon Snell.

Somewhere about the year 1869 a father brought three sons to enter them for the surgical practice of the Leeds Infirmary. The eldest, Enoch, is in practice in Nottingham. The second, John, died a short time ago at Gargrave, in Yorkshire. The third, Simeon, is the one whose recent death in the height of his fame we are now deploring.

About the time of his obtaining his diploma he acted as my private clinical assistant, and thus his interest and attention were directed towards ophthalmic science, an interest which was confirmed and intensified by his subsequent attendance at Moorfields, and his association with Sir Wm. Bowman.

When the time arrived for his settling down in practice, he became a partner with a family practitioner in Sheffield, being attracted to the partnership by the fact that the gentleman had a considerable ophthalmic *clientele*, and was at the time the leading ophthalmic practitioner in Sheffield.

This gave him his opportunity, fresh as he was from Moorfields, inspired by all the latest developments of ophthalmic science. Now, from such a basis, he rapidly acquired a leading position in the town, and eventually in the Sheffield Infirmary, others can tell better than I can.

Clear-headed, accurate, and enthusiastic, he was keenly alive to all advances and improvements in ophthalmology, whether in this country or in foreign lands.

T. PRIDGIN TEALE.

NORTH GERRARD,

HEADINGLEY, LEEDS.

April 25th, 1906.

Charles Bell Taylor died at his residence, Beechwood Hall, Mapperley Park, Nottingham, on April 13th, from influenza, at the advanced age of 80 years. He was born in Nottingham, where his father and brother were veterinary surgeons. He received his medical education at the University of Edinburgh and in Paris. Taylor started his professional career as a mental specialist, and afterwards took up diseases of the chest. But in 1859 he was appointed surgeon to the new Nottingham and Midland Eye Infirmary, and for many years enjoyed a practice in eye work that extended far beyond the confines of his native town, and, indeed, beyond those of Great Britain itself. As an operator he was unsurpassed. His dexterity in removing cataract was really wonderful. The darkened chamber (Taylor invariably operated by the concentrated light of a paraffin lamp), the impassive surgeon, the placid patient, and the absolute silence—all went to complete a picture that once seen could never be forgotten. His only assistant was a man-servant, who had been in Taylor's employment for many years. In many respects Taylor, who never married, was a remarkable man. His personality was most impressive—tall, with piercing black eyes and determined mouth; small wonder that so striking an appearance impressed those who came into contact with him. Bell Taylor's reputation among the public was even greater than among his professional brethren, to whom much offence had been given by his attitude upon controversial matters, such as the Contagious Disease Act, vaccination, and vivisection. He took a prominent and professionally unpopular part in securing the repeal of the Contagious Diseases Act; he was a determined opponent of vivisection, which he held as useless as it was inhumane; and he set his face sternly against anything like compulsory vaccination. Unorthodox and unconventional Taylor undoubtedly was, and that rendered him less popular among his medical brethren than would otherwise have been the case. At the same time, he was an ophthalmic surgeon of exceptional

skill, especially from the operative side, and he possessed much humour and even more humanity, as many a poor denizen of Nottingham and its neighbourhood can testify. Some of his eccentricities were well described by the late Colonel Anstruther Thomson, Master of the Pychley, in his *Eighty Years Reminiscences*. In 1886 he had to consult Bell Taylor, and found the rooms and passages of his house in Park Row, Nottingham, crowded with patients.

"Bell Taylor," he continued, "was a most amusing and eccentric man. He lived about four miles out of the town. In the morning he breakfasted on porridge and treacle, walked about his garden, composing medical lectures or political papers. He was a keen Conservative. He then mounted a tricycle and rode into Nottingham. He had about thirty tricycles and bicycles in his coachhouses. He had a small wooden house at the top of the hill, where he left his bike, got into a cab, and went to his hospital—I think he had two or three houses with patients—and then to his rooms, which were full. He had



C. BELL TAYLOR

lunch at three o'clock in the kitchen, which was very prettily got up with coloured glass and tiles, and had two nice white horses in loose boxes close by with looking glasses so that they could see themselves. He used to come and sit with me about ten o'clock. I said, "Have you had a busy day?" "I have seen a hundred and ten fellows, and operated ten times." At eleven o'clock he mounted his bike, and rode home to his country house."

The death is announced of Mr. Charles Ernest Baker, at the age of 44 years, from an overdose of veronal. Mr. Baker had been clinical assistant to the Royal Eye Hospital, Southwark, London. He was, however, in general practice in South Kensington.

Dr. José Ramas died in Mexico, on February 26th last.

Dr. Joseph W. Jewett, of New Haven, is dead at the age of 54 years.

Dr. William A. Whayne, of Pueblo, Colorado, died on February 6th, aged 44 years, from pneumonia.

Dr. Karl Hotz, once professor of ophthalmology at Rush Medical College, Chicago, is dead.

Henry Bausch, Vice-President of the Bausch and Lomb Optical Company, Rochester, N.Y., died on March 2nd in Augusta, Ga., at the age of 50 years.

Appointments.

DR. V. PHILAMOFF has been appointed *privat-docent* of ophthalmology in the University of Odessa. Dr. J. J. Pattee has been appointed oculist and aurist to the Minnequa Hospital. Dr. Joseph H. Potts has been appointed oculist and aurist to the New Britain Connecticut General Hospital. Dr. C. Bahn has been appointed consulting ophthalmologist to the Louisiana Anti-Tuberculosis League. The title of professor has been bestowed upon Dr. Paul Hethey, Assistant in the Berlin University Eye Klinik. Arthur Fells has been appointed Clinical Assistant at the Bristol Eye Dispensary. Frank Leslie Thomas has been appointed ophthalmic surgeon to the North Devon Infirmary at Barnstaple.

+ * * *

The Howe Eye Hospital.

FROM a recent number of our contemporary, the *Ophthalmic Record*, we learn that the State Board of Charities of New York have approved the articles of incorporation of the new special hospital to be erected in Buffalo by Dr. Lucien Howe. The institution will be known as the "Howe Eye Hospital."

* * * *

A School Hospital.

THE Hospital St. Luc will shortly be opened at Montreal for the treatment of eye, ear, nose, and throat cases amongst elementary school children.

* * * *

St. Louis Medical Society.

AT the Annual meeting of the ophthalmic section of the St. Louis Medical Society, held on January 13th, the following officers were elected:—Adolph Alt (Chairman); John Green, junior, Secretary; and Llewellyn Williamson (Editor).

* * * *

Chicago Ophthalmological Society.

THE following are the names of the officers for the coming year:—Frank Alport (President), William A. Mann (Vice-President), Willis O. Nance (Secretary), Guildford (Councillor), and Thomas Faith (Delegate to the Chicago Medical Society).

* * * *

Annual Meeting of the British Medical Association.

THE seventy-seventh annual meeting of the British Medical Association, as readers already know, will be held from 27th to 30th July, at Belfast. As regards the Section of Ophthalmology (President: John Walton Browne, Belfast), the subjects chosen for discussion are:—1. Eye injuries in their relation to the Workmen's Compensation Act. 2. Vascular diseases of the retina. 3. The diseases of the lymphoid tissue of the conjunctiva. Communications to the hon. secretaries:—James A. Craig, 11, University Square, Belfast; Leslie J. Paton, 1, Spanish Place, London, W.

* * * *

Two clever rogues have been visiting the schools of the Cumberland Education Authority in the character of ophthalmic inspectors. At Keswick, they deceived the head master by mentioning they were sent by the school medical officer (Dr. Morrison), and proceeded to test the eyesight of the children. They then went through the same procedure at the schools in the district, and in each case they persuaded parents and others to pay sums of money for spectacles to be supplied to the children at a later date. It is some satisfaction that these swindlers have been laid by the heels, and their exposure should prove a useful warning to other school teachers who may be inclined to treat strangers with too much confidence.—*The Medical Officer*, March 27th, 1909.

* * * *

Optometry Laws. EIGHTEEN of the American States now possess optometry laws, legalizing and regulating the practice of sight-testing by opticians, the latest additions being Delaware, Maine, North Carolina, and West Virginia. Canada also manifests an intention of following the example, be it good or bad, set by the United States. The province of Manitoba enacted an optometry law on March 10th last. In the meantime an optometry bill for Pennsylvania has been "held up" by the efforts of the medical profession, which has introduced the Herbst Shreve medical bill as a retaliatory measure. Illinois, also, is the scene of strife. The medical profession in that State has met an optometry bill by a counter-measure, which provides that any individual who shall examine or test the eyes of another person and prescribe the use of glasses therefor, shall be regarded as practising medicine. Signs are not wanting which show that we shall before long hear more of the proposal to legalize sight-testing by opticians in Great Britain. Internecine strife between the various sects of the industry has now been healed, and in these circumstances an attempt will almost certainly be made to introduce a Bill into Parliament on lines somewhat similar to that successfully opposed by the medical profession but a few years ago. That the lull is more apparent than real is shown by the anxiety of the trade to oppose the granting of a Royal Charter to the British Medical Association.

* * * *

Xlth International Congress of Ophthalmology. THE Inauguration of the Xlth International Congress of Ophthalmology took place on Friday, April 2nd, in the Great Hall of the Royal University of Naples. The Mayor of Naples presided, supported by the Rector of the University and by numerous Professors.

The large hall was filled with oculists of every nation and many ladies. Amongst others were Professors Falchi, Sattler, Hess, Axenfeld, de Lapersonne, Dupur, Marques, von Grosz, Dimmer, van Duyse, Snellen, Birschfeld, and Doctors Landolt, Mackay, Rowan, Menacho, Lucien Howe, Tomlinson, Percival, Grossmann, and MacCallan.

After speeches of welcome by the Syndic, the Rector, and Professor Angelucci, the Congress was declared open. In the evening there was a largely attended reception at the Hotel de Ville. On Saturday, April 3rd, the real work of the Congress commenced, and Professor Angelucci was

ected President of the Congress. The members who presided at the meetings were Professor de Lapersonne, Professor von Grosz, Mr. Jessop, and Professor Sattler.

The first communication was the report on the Unification of the Notation of Visual Acuity, sent by the Committee appointed by the Utrecht Congress (Messrs. Charpentier, Dimmer, Eperon, Hess, Jessop, Nüel, and Reymond), and communicated by Professor Hess. There was very little discussion, and the report was passed with only three dissentients.

The second report from the same Committee on the Unification of Notation of the Meridians of Astigmatism was communicated by W. H. H. Jessop, and after discussion, the following was passed: (1) That the meridians of astigmatism should be measured and represented as the observer looks at the patient. (2) That the best and most practical method to measure and represent the axes is in the upper semi-circle as in a trial frame. The numbering of the axes should start from the middle line of the face in each eye and proceed upwards and temporalwards. The zero would therefore lie at the nasal end of the semi-circle and 180° at the temporal end; 90° would be above and midway between these points.

The papers presented numbered over a hundred and filled up the three sittings. One afternoon was devoted to demonstrations at the University Ophthalmic Clinic, where there was also an excellent exhibition of instruments, etc.

The hospitality displayed was lavish and princely, and included a steamer excursion to Capri, an afternoon at Pompeii, a reception by Professor and Madame Angelucci, a garden party at Vomero, and a lunch by the Rector of the University. All the sights of Naples were thrown open free to the Congressists.

At the final meeting on Wednesday, April 7th, after speeches from representatives of the different nations thanking Professor Angelucci and the Committee for their great hospitality, etc., the meeting proceeded to choose the place for the next Congress. America, St. Petersburg, and Egypt were suggested and voted on. The choice fell on St. Petersburg, and Professor Bellarmino was appointed the Organising President.

It was resolved to appoint a Committee to report on the treatment of Ophthalmia Neonatorum to the next Congress.

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TWO SHILLINGS.

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ORIGINAL COMMUNICATIONS.

A THEORY OF DIPLOPIA.

BY

ABDULLAH KALIL SALLOM,
OF KOUSBA, MOUNT LEBANON, SYRIA:

AND

MARY SALLOM,
OF KOUSBA, MOUNT LEBANON, SYRIA:

A Theory of Diplopia.

BEFORE proceeding to set forth the theory, it is necessary to recall a few well-known facts in anatomy and pathology, for it is only by their thorough study that we can hope to be able satisfactorily to understand the condition with which we are dealing. Among these may be mentioned:—

1st.—That the fibres coming from the nasal side of one eye, and the temporal side of the other eye represent the same visual field, and terminate in an arborization around cells in the external geniculate body, pulvinar of the optic thalamus and brachium of the posterior corpora quadrigemina.

2nd.—That the dendrites of the cells in the lower visual centres come in close relationship with the terminal arborization of the nerve fibres coming from the retina.

3rd.—That more than one fibre influences a given cell.

4th.—That destruction of definite parts of the cortex will cause blindness of definite parts of the retina.

5th.—That we have a set of fibres which connect one visual area in the cortex with the visual area of the other side.

6th.—That the fovea is represented in both of the visual areas of the cortex so that destruction of one of these areas will not cause total blindness of the fovea.

With the above well-established facts in hand, we may now proceed to set forth how two images normally received by the retinae are fused as it were into a single image and to explain why in certain conditions diplopia results. We will first take up the normal condition of affairs. In figure (1); the rays of light coming from the arrow (A) in the left peripheral field of vision fall upon identical points of the retinae.

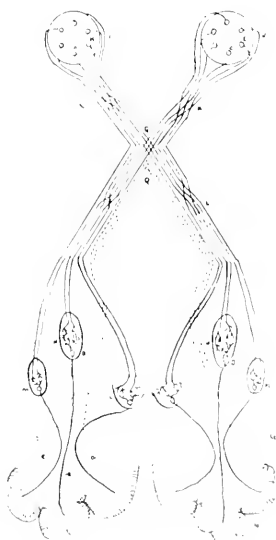
There visual impulses are set up, which are carried by the fibre (B) in the right eye and the fibre (C) in the left eye, both of these fibres having for their destination the right posterior corpus quadrigeminum. Here the fibres terminating in an arborization come into a close relationship, and influence a cell in that situation. This cell now takes up the impulse received from the two fibres and conveys it to the cortex, whereby but one image (G) is formed, since only one impulse has been received. It is evident, therefore, that whether fibre A or B, or both, carry the impulse, but one cell can be influenced, and but one image can be formed. If one eye is closed naturally, the impulse which influences the cell will be weaker than when both eyes are opened, and the two impulses are operating upon the same cell. (It is hardly necessary to add that it is a common observation that we can see better with two eyes than with one.

When for any reason the eye is turned inwards, we have, as is shown in Fig. 2, the rays of light coming from the arrow (A) falling upon non-corresponding points of the two retinas. The impulse of the right eye will be carried by the fibre (B) which will eventually end around and influence the cell in the pulvinar of the right optic thalamus, and from there the impulse is carried by another fibre to form the image (D) in the cortex. On the other hand, the impulse generated in the left eye being received upon a non-corresponding point of the retina, will be carried by the fibre (C) which will

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finally terminate around and influence a cell in the right external geniculate body. The cell in this external geniculate body takes up the impulse and carries it to the cortex to there form another image (E). Thus two images are formed. It will be seen that both images are formed in the right cortex, and that the image of the left eye is external to the image formed by the right eye. This is in accordance with clinical observations, viz., that when the eye is turned in, we have the condition of homonymous diplopia. This explanation is a step further to that already offered when it is said that the impulse received in the left eye at (C) will be projected to the left field of vision because we have learned to so project it by experience.

When the eye is turned outwards, as shown in Fig. 3, the rays of light coming from the arrow (A) in the left peripheral field of vision do not fall upon identical points of the retina. In the right eye, the impulses are carried by the fibre (B), which finally ends around and influences the cell in the right posterior corpus quadrigeminum. This cell, taking up the impulse, carries it to the cortex, and there forms the image (C). The impulse received by the left eye will be carried by the fibre (D) which ends around the cell in the left posterior corpus quadrigeminum. Then the impulse is taken up and carried to the cortex, only to form a second image (E). It will be seen, however, that in this condition the image received by the right eye is formed in the right visual area of the cortex, while that of the left is formed in the left area. The right image is, therefore, projected to the left visual field, while the left image being received in the left cortical area, is properly projected (though abnormally received) to the right field of vision.

So far we have limited ourselves to the peripheral fields of vision and omitted the consideration of the fovea. At first glance it would seem that the fovea being represented on both sides, necessarily argues against what has been previously stated. Upon more careful examination, we find that far from disproving the theory, it comes in accord with it. The fovea being represented on both sides of the cortex, destruction of one side does not cause total blindness of the fovea. A glance at figure 4 will show the condition of affairs which undoubtedly exists. To understand this we must first bear in mind that the fovea does not follow the same rule which applies to the rest of the eye, viz.: that the temporal side of one eye and nasal side of the other eye go to one cuneus. In the fovea there is really no nasal and no temporal half. The spot (A) in fig. 4 will carry the impulse to cell (B). The identical point (C) in the fovea of the other eye will also carry its impulse to the same cell (B). The next point to (A), which is (H), will carry the impulse to the opposite side—cell (D), and the identical point (I) in the other fovea will also carry its impulse to (D). This arrangement is retained throughout the entire fovea. One point will carry impulse to the cells on the same side, and the adjacent point to the cells on opposite side. The fibres going to the same side and those going to the opposite side are situated alternately side by side. In other words, we have no definite area in the fovea where the fibres that go to same side and those which cross are grouped. As a result, only one half of the image is formed on the right side in the cortex (E), while the other half is on the left side (F). The image, however, is made whole by the fibres which connect the two visual areas in the cortex. If one of the visual areas is destroyed, half of the impulses normally received would be absent—hence the defect in the acuity of the vision.

In conclusion, the theory may be summarized as follows:

1st. That fibres coming from identical points of the retina end around and influence only one cell in the lower visual centre. This cell takes up the impulse and carries it to the cortex. Therefore, whether the impulse is carried

by the fibre coming from the right eye or from an identical point in the left eye, or both, but one cell can be influenced and but one image can be formed. (Figure 1).

2nd. If non-identical points are stimulated, two cells in the lower visual centre are influenced. Each cell carries the impulse which it has received to the cortex. Two images are formed since two impulses have been received.

3rd. When one eye is turned inward, the image formed by the opposite eye, on account of the anatomical structure, will be external to the image formed by the one on the same side. Therefore, both images will be projected to the opposite field of vision, and the image formed by the opposite eye will be in either visual field, external to the image formed by the eye on the same side (figure 2). Hence the images correspond in position to the eyes.

4th. For the same reason, when one eye (for example, the left) is turned away from its fellow, its image will be formed in the left cortex, and the image from the right eye will be formed in the right cortex. The right image is projected to the left field of vision, and the left image is projected to the right visual field—hence the images are crossed.

5th. As there is really no nasal half in the fovea where the fibres that cross are grouped, and no temporal half where the fibres that go to the same side are situated, and as the fibres going to the same side and those passing to the opposite side are situated side by side, therefore only one half of the image is formed on the right side of the cortex, while the other half is formed on the left; the image being made whole by the fibres which connect the two visual areas in the cortex. (Fig. 4.)

ON THE WORK OF THE OPHTHALMIA WARD IN ST. PAUL'S HOSPITAL, LIVERPOOL.

BY

A. NIMMO WALKER, B.A., M.B., B.C. (Cantab.),

HON. SURGEON TO ST. PAUL'S HOSPITAL AND TO THE SCHOOL FOR THE INDIGENT BLIND,
LIVERPOOL.

THIS ward, which is believed to be the first of its kind, is the realization of a scheme which the writer first proposed in March, 1907 (*Brit. Med. Journ.*, April 5th, 1907), and which he elaborated in a paper read before the North of England Union of Institutions, Societies, and Agencies for the Blind, at Liverpool in December, 1907 (*Lancet*, May 2nd, 1908). The essence of the scheme consists of the immediate treatment of infants attacked with purulent ophthalmia, either in the special ward, whither the infant with its mother is removed by ambulance, or failing removal, in the out-patient department.

Early knowledge is obtained of the occurrence of every case of ophthalmia in the practice of the midwives of Liverpool by the Health Authorities, who, under the Midwives Act, 1902, enforce what is practically compulsory notification by their instructions that any abnormal symptom in mother or child must be notified immediately to the Health Department, under penalty of suspension or report to the Central Midwives Board for neglect of this regulation.

It is evident, however, that notification would be useless without treatment. Here voluntary effort takes up the work by the provision of treatment at St. Paul's Hospital.

The method of procedure is as follows.—As soon as a midwife discovers any sign of inflammation in an infant's eyes, she notifies the case to the Health Authority. The lady inspector visits the case, and sees that proper

arrangements are made for the treatment, either by the calling in of a doctor, or, if the parents are too poor, by the taking of the case to hospital. There it is seen by one of the surgeons, and, if necessary, detained while the Health Authorities are asked by telephone to send an ambulance to bring the mother; as a rule, the mother is willing to come, and she and her child are put in the special ward. If, however, the mother is unable to come, or the ward is full, arrangements are made for the child to be brought several times daily to the out-patient department, and instructions also are given for the treatment at home. This is recognised to be less satisfactory than in-patient treatment, but it is often necessitated by the present small size of the ward (4 beds and 4 cots). It is hoped, however, that a special department will be provided shortly, with out-patient dressing room, and with a ward of at least ten beds and ten cots.

The midwives, with few exceptions, have shown themselves eager to notify these cases and to bring them to hospital, and the doctors, also, working in the poor districts, are glad to avail themselves of the special facilities for treatment afforded by the ward.

The scheme has been under trial for almost eighteen months, and it is possible now to make some definite statements.

In the first place, an answer can be given to the only serious objection that has been urged against the scheme: *i.e.*, that it is unsafe to move mothers so soon after childbirth. Forty-four mothers have been admitted and five only have given trouble. Two had slight mastitis; one had bronchitis for two days after having been out of hospital for the afternoon; one was admitted with foul lochia, which cleared up in a short time with douching; and one had abdominal pain with rise of temperature two days after admission (fourteenth day after birth of child) which was quickly cured by castor oil, poultices, and douching. The last case was the only one which could be ascribed in any way to the removal of the patient, and it was due, more probably, to constipation.

Secondly, there is no doubt, in the writer's mind, that cases of ophthalmia neonatorum can be treated more successfully as in-patients than as out-patients. Several cases which were transferred to the out-patient department too soon, owing to pressure on beds, became worse, and had to be readmitted. One particularly disastrous case will be related later.

Thirdly, the duration of the disease varies directly, and the chance of recovery inversely, with the length of time which has elapsed between the onset and the admission to hospital.

The statistics for the year 1908 are:—

Cases.	Both eyes saved.	One eye saved.	Blind.	No record.
75	57	7	7	4

Of the cases which became blind, five had both eyes sloughing on first attendance at the hospital. Of the other two, one was admitted quite early in the disease, but the baby appeared to have no powers of resistance, and treatment was of no avail. It died from enteritis a month after discharge.

The other case illustrates the necessity for ample bed accommodation. The child was admitted early, did well, and was transferred, as the bed was wanted for a more urgent case, to the out-patient department, with eyes open and discharge slight, but still present. In spite of warning, the mother ceased to bring the child after a few days, and it was not seen until it was brought by a neighbour. The lids then were swollen and tightly closed, and the eyes had not been touched for two days, owing to the mother having "cramps in the stomach." The corneæ were already sloughing, and, in spite of immediate admission, the eyes were lost.

A comparison between the state of the eyes on admission and the final result shows the efficiency of hospital treatment.

	Eyes	Cornea intact.	Cornea slightly affected.	Cornea severely affected.	No record.
Condition on first visit	150	126	7	17	0
Final result	150	116	6	20	8

Of the four cases where a final result could not be recorded, owing to the parents having ceased to attend, and being untraceable, it is probable from the last notes taken that six eyes were intact, one slightly, and one severely damaged.

A further analysis of these figures shows a remarkable improvement in the second half-year compared with the first.

	Eyes.	Cornea affected on 1st visit.	Cornea permanently injured.	No record.	Average duration of disease before 1st visit.
1st Half-year ..	66	13	14	4	23·6 days.
2nd Half-year	84	11	12	4	6·7 days.

This improvement is coincident with the diminution in the duration of the disease before the child is brought to hospital, which, as the figures show, fell from an average of 23·6 days in the first half-year to 6·7 days in the second.

This diminution is due to the interest which has been aroused in Liverpool, and to the efforts which are being made to educate the midwives in this subject.

At the invitation of Dr. H. Briggs, professor of midwifery in the University of Liverpool, the writer gave a lecture on ophthalmia neonatorum as part of the course of lectures to the Liverpool Association of Certified Midwives, and he hopes that with increased accommodation, arrangements may be made for midwife pupils to attend the practice of the ward for a short time.

Chief credit however, for the improvement in results must be given to Sister Alston, in charge of the department, and to the other nurses, who have shown the greatest enthusiasm and care in carrying out all details, however tedious, of treatment; and to Mrs. Adrian, lady inspector of midwives, who has sent the majority of cases, and has often brought them herself.

An important development is now taking place, in that midwives are beginning to send cases even before there is any sign of inflammation, if from the condition of the mother they suspect danger.

A film is taken in these, as in all other, cases, the eyes are thoroughly irrigated with sodium bicarbonate lotion, and 30 per cent. argyrol is instilled. Orders are given for the child to be brought back on the following day, when if there are no signs of inflammation and the film is negative, the child is considered safe; but if the film is positive, or there are signs of inflammation, treatment is continued, and the child admitted to hospital if necessary.

This method of prophylaxis is more scientific than the indiscriminate use by midwives of antiseptic drops, which, in their hands, may be a source rather of danger than of safety.

In regard to treatment, this ward affords excellent opportunities for the study of different methods; and the writer is engaged at present in clinical and bacteriological investigations which are outside the scope of this article, but which he hopes to publish later.

In conclusion, he feels that it may be claimed:—1. That the year's working has shown the scheme to be practicable. 2. That the co-operation of the Health Authority with a charitable special hospital is the best method of dealing with this disease, as the combination is thereby obtained of special experience in the collection and removal of cases with special experience in their treatment.

REMARKS ON THE USE OF CALMETTE'S OPHTHALMO-REACTION FOR TUBERCULOSIS.

BY

ARCHIBALD W. HARRINGTON,
M.D. GLASGOW.

AND

ARTHUR J. BALLANTYNE,
M.D. GLASGOW.

In view of the doubts which still exist as to the value of the conjunctival reaction to tuberculin, and in view of the importance of determining as soon and as decidedly as possible the position which is to be assigned to it among our diagnostic methods, it seems desirable to publish the results of all cases in which it has been employed. The following paper does not profess to be an exhaustive discussion of the subject, but merely a record of the results which we have obtained from an unprejudiced trial of the method in question. The principal details will be found in the accompanying table.

The materials employed.—The tuberculin preparations used were obtained through firms of wholesale chemists, who now supply them to the profession in several forms—namely, either in solution, contained in hermetically sealed tubes, or as powder or tablets to be dissolved in a stated quantity of water. Our preparations were supplied by three firms in the liquid and powder forms and were employed by us as follows.—Firm A: a 1 per cent. solution in sealed tubes. Firm B: (1) a 0·5 per cent. solution in sealed tubes; (2) the dry product in 0·5 per cent. solution; and (3) the dry product in 0·25 per cent. solution. Firm C: (1) a 0·5 per cent. solution in sealed tubes; (2) the dry product in 0·5 per cent. solution; and (3) the dry product in 1 per cent. solution. As may be seen from the table, the number of cases tested by each of these was: A, 15 cases; B, (1) 21 cases, (2) 4 cases, and (3) 52 cases; C, (1) 10 cases, (2) 17 cases, and (3) 20 cases, total, 139 cases. Or, grouping the cases according to the strength of solution used, we tested with 0·25 per cent. solution, 52 cases; with 0·5 per cent., 52 cases; and with 1 per cent., 35 cases.

Method.—The ages of the patients to whom the test was applied ranged from 10 months to 66 years. Each one was carefully examined to ascertain whether there was any clinical evidence of tubercle, before applying the test. In employing the prepared liquid from the sealed tubes the tube was opened and the fluid applied at once. Only a single drop was used in each case. It was placed in the lower conjunctival sulcus, the lids kept apart for a few seconds, and the patient warned to avoid forcible closure of the lids. As the preparations are quite bland, there was never any spasm or lachrymation which would prevent the retention of the fluid in the sac. When the dry preparation was employed, the prescribed quantity of distilled water was added to the phial by means of the pipette supplied. It was then shaken for a minute or

two until solution appeared to be complete, and the solution applied at once in the manner described above. In only two cases was this rule broken through, the solution being applied 24 hours after its preparation (Cases 113 and 114). The application was never made twice to the same eye.

These details are given in order that others may have the opportunity of criticising the results. There have been considerable discrepancies in the results obtained by different observers, for which differences of technique must be largely responsible, and too often the details which would enable one to criticise the results are omitted from the records.

It would facilitate the comparison of results if some uniformity of method were adhered to. In the matter of dosage there is considerable room for variation. Some manufacturers direct that "one or two" drops be used; with another preparation we are told to use "two or three" drops. Moreover, the strength of the ready-made solutions varies and is not always stated. Wolff-Eisner, who was the first to suggest this test, advised the use of 1-1000 solution of old tuberculin. We are told* that the Hoechst preparation of old tuberculin is ten times the strength of Calmette's preparation, in which case the 0·1 per cent. solution of this firm will be equivalent to the 1 per cent. solution used by Calmette. Some authors even report the use of solutions as strong as 4 per cent., but there is now good reason to believe that the weaker solutions give as reliable, if not more reliable, results, while their employment probably involves less risk.

Reliability of the test.—Our cases may be divided into: (1) the clinically tuberculous (including all suspected of tuberculosis, whether the tubercle bacillus or other conclusive evidence of tubercle was found or not), 16 cases; and (2) the clinically non-tuberculous, 123 cases. In eight cases the clinical diagnosis was supported or corrected by the results of post-mortem examination.

Results.—Of the 16 supposed tuberculous subjects 12 gave a positive reaction = 75 per cent. Of the 123 supposed non-tuberculous subjects 39 gave a positive reaction = 31·7 per cent. The tests of the tuberculous cases were as follows—

With the 0·25 per cent. solution 4 cases with 3 positive results.

" " 0·5 " " 6 " " 5 " "

" " 1·0 " " 6 " " 4 " "

The four tuberculous cases which gave no reaction were tested with 0·25 per cent., 0·5 per cent., 1 per cent., and 1 per cent. solutions respectively.

Coming now to the 123 non-tuberculous cases in which the test was applied the materials used and their results were as follows:—

Preparation.	Strength.	No.	Positive.	Negative.	Percentage positive.
PERCENT.					Per cent.
A	1·0	11	0	11	0
B (1)	0·5	10	4	10	15·0
B (2)	0·5	2	1	1	50·0
B (3)	0·25	18	13	35	27·0
C (1)	0·5	10	5	5	50·0
C (2)	0·5	15	5	10	33·3
C (3)	1·0	15	12	3	80·0

* Dr. F. EISENBERG. *THE OPHTHALMOSCOPE*, Vol. VI, July, 1908, p. 501.

That is to say, the 0.25 per cent. solution in 48 cases gave 27 per cent. positive reactions, the 0.5 per cent. solution in 46 cases gave 29.8 per cent. positive reactions, and the 1 per cent. solution in 29 cases gave 41.3 per cent. positive reactions.

These results do not lend much support to the supposed reliability of the test. It is a somewhat striking fact that the 1 per cent. solution of one firm seemed to be inert, producing no reaction in 14 non-tuberculous and one tuberculous subject, while the 1 per cent. solution of another firm gave 80 per cent. of positive results in both tuberculous and non-tuberculous. With these results before us we could not place much reliance on the occurrence of a positive reaction, while, on the other hand, the failure to react seems to have a certain value as indicating the absence of tubercle.

One writer on this subject, who after a trial of the test in cases of pulmonary disease expresses his faith in it, states that "there is practically no relation between the age or condition of the patient, the state of the lungs, the activity or quiescence of the lesion, and the amount or duration of reaction." If this be true, it casts very grave doubt on the specificity of the reaction. The same author says: "I have never seen a positive result in a case in which I was unable to find some tuberculous lesion." It will be seen that our experience has been quite opposed to this.

Safety of the reaction.—As regards the character of the reaction produced, even a short experience of the test shows that departures from the type of reaction usually described are far from uncommon. Considering our cases as a whole we find that the duration of the reaction produced tends to be a good deal longer than that commonly stated—namely, two or three days. Such a short duration of the effect was the exception. Five or six days' duration was common, while we had cases in which the effects lasted, sometimes in a troublesome form, for 15, 21, 31, or even 60 days. The average of all the cases would be at least ten days. In quite a number of cases a relative hyperæmia of the affected conjunctiva was visible for many days after the cessation of all discharge and of all subjective disturbance. In the cases in which the reaction did not spontaneously subside within a few days we found that the conjunctivitis was practically uninfluenced by treatment. A number of remedies were tried, none of which appeared to cut short the inflammation, but lotions of sodium chloride 1 per cent. and instillations of argyrol were usually found grateful to the patient. Most of the positive reactions were of the usually described type—viz., a thickening and hyperæmia of the lower palpebral conjunctiva and still more markedly of the plica and caruncle, some hyperæmia of the lower part of the conjunctiva bulbi, and a small amount of catarrhal or fibrinous exudate. At the same time the patient complained of sticking of the lids the morning after the application, and sometimes of a little pain and watering. As a rule, even with a well-marked or excessive reaction no pain was complained of.

Some of the unusual or additional effects of the reaction were: œdema and thickening of the lids, marked bulbar injection, phlyctenular nodules on the bulbar conjunctiva, granular elevations on the bulbar conjunctiva, follicular hypertrophy or actual granulations in the palpebral conjunctiva, swelling of the submaxillary gland, chemosis, conjunctival ecchymosis, inequality of the pupils, drooping of the eyelid, delayed reaction, bilateral reaction, and relapsing reaction. In several cases in which the reaction was of the usual duration and caused no pain the amount of discharge and redness was such as to cause the patient some alarm. No elevation of temperature was found which could be traced to the application of tuberculin.

* Dr. G. Lovell Gullano; Scottish Medical and Surgical Journal, April, 1908, p. 310.

If we look for any circumstance which might influence the occurrence of the reaction in non-tuberculous subjects we find that in several cases which gave a positive response there was a marked degree of anaemia. On the other hand, there were cases which gave a well-marked reaction in which no anaemia could be shown to exist, and others with pronounced anaemia did not react.

Again, among the positive reactions we had some whose eyes had been more or less abnormal (nebulæ from keratitis in childhood, loss of lashes, optic neuritis, and various degrees of conjunctival irritation), while others (with nebulæ, trachoma, and conjunctival irritation) gave a negative result.

The following abbreviated notes of some of the cases may be taken as illustrating some of the atypical results obtained:—

CASE 12. A female, aged 20 years: rheumatic endocarditis, no evidence of tuberculosis, well-marked anaemia, no history of sore eyes. On December 23rd, 1907, in the left eye one drop of 1 per cent. solution of dry tuberculin. Reaction began from six to eight hours later, becoming more pronounced up to the 25th, then gradually subsided until January 1st, 1908, when the eye turned sore and showed a small yellowish translucent nodule two or three millimetres up and in from the cornea surrounded by conjunctival injection. On January 20th the nodule had gone and the eye was quiet.

CASE 23. A woman, aged 44 years, rheumatism. No evidence of tubercle. On December 31st, 1907, in the right eye a drop of 1 per cent. solution of dry tuberculin. Reaction began from six to eight hours later and was well marked with muco-purulent discharge, etc., in 24 hours. Complaint of pain and stickiness of the lids. Eighteen days later still injected and other eye now injected and sore. On February 2nd, 1908, a relapse in the right eye after being practically well. Two phlyctenular nodules on outer side of eyeball.

CASE 32. A woman, aged 46 years: locomotor ataxy. No evidence of tubercle. Corneal nebulæ but eyes free from any irritation at time of application. On Jan. 28th, 1908, in the left eye a drop of 0·5 per cent. solution from a sealed tube. Reaction began as usual and was at its height in 24 hours. In addition to the hyperæmia there were granulations on the lower palpebral conjunctiva. The condition improved up to Feb. 2nd, when the eye became sore again. Lower lid became firm and swollen from oedema. Lower palpebral conjunctiva red, thickened, and granular, with two small pustular spots situated under the conjunctiva. A large number of minute transparent elevations scattered over the bulbar conjunctiva, best seen by lateral illumination and reminding one of the miliary elevations sometimes seen on the ependyma of the brain. Swelling of the submaxillary gland. The pustular spots soon disappeared but the other conditions were still present on Feb. 18th.

CASE 64. A man, aged 53 years. Cancer of the liver. No evidence of tubercle; anæmic; eyes normal. On April 13th, 1908, in the left eye one drop of 0·25 per cent. solution of dry tuberculin. On the next day typical reaction was well established. 15th, reaction increased; chemosis; bulbar injection; swelling of lid. 16th, conjunctival ecchymosis on lower part of globe. Next day ecchymosis extended all over the globe except above. Chemosis and lid swelling subsiding. Ten days later haemorrhage almost gone. The only complaint made was that the eye was watery and the lids sticky.

It will be noticed that the strength of the solution used in the above cases was in one case 0·25 per cent., in another 0·5 per cent., and in the other two 1 per cent. We therefore cannot lay down a rule that any particular strength of solution is safe, but in view of the fact that the 1 per cent. solutions gave a proportion of positive reactions which was certainly too high, we should be inclined to deprecate the use of the stronger solutions. While none of our cases suffered any permanent injury from the test, nevertheless some of the results were sufficiently disconcerting to make one timid in using even the weaker solutions, and that much more serious consequences may arise is clearly established by the increasing number of such cases now being reported, a considerable number of which have been collected by Dr. Ernest Thomson.*

As the result of our experience of the test, small though it be, we are forced to the conclusion that it is neither safe nor reliable. We are aware that some writers have found it both safe and reliable, but the experience of others has agreed more closely with our own, and until this inconsistency is explained and the method so modified as to give uniform results in the hands of all reasonably careful observers the test cannot be recommended for universal application.

Result of the Conjunctival Tuberculin Test in 139 Cases.

No.	Years of age	Diagnosis	Tuberculin reaction (N.T.)	Preparation used	Reaction
1	33	Alcoholic neuritis	N. T.	C (1)	
2	21	Syringomyelia	N. T.	C (1)	
3	50	Acute rheumatism	N. T.	C (1)	
4	12	Hæmatopoophthalmia	N. T.	C (1)	
5	28	Cerebral tumour	N. T.	C (3)	
6	13 ¹ ₂	Acute nephritis	N. T.	C (3)	
7	27	Rheumatism: phthisis	T.	C (3)	+
8	40	Phthisis	T.	C (3)	+
9	40	Bronchiectasis	N. T.	C (3)	+
10	35	Bronchitis	T.	C (3)	+
11	7	Chorea	N. T.	C (3)	
12	20	Rheumatic endocarditis	N. T.	C (3)	
13	10	Acute rheumatism	N. T.	C (3)	+
14	21 ¹ ₂	Acute nephritis	N. T.	C (3)	+
15	17	Anæmia	N. T.	C (3)	+
16	10	Pneumonia	N. T.	C (3)	+
17	35	Phthisis	T.	C (3)	+
18	40	Acute nephritis	N. T.	C (3)	+
19	49	Gastric disease	N. T.	C (3)	
20	18	Endocarditis	N. T.	C (3)	
21	40	Cirrhosis of liver	N. T.	C (3)	+
22	40	Anæmia	N. T.	C (3)	+
23	44	Subacute rheumatism	N. T.	C (3)	+
24	50	Cirrhosis of liver. Pleurisy	T.	C (3)	
25	37	Rheumatoid arthritis	N. T.	C (1)	+
26	66	Bronchitis	N. T.	A	—
27	33	Endocarditis	N. T.	A	—
28	55	Rheumatoid arthritis	N. T.	C (1)	—
29	54	Endocarditis	N. T.	A	—
30	22	Acute pneumonia	N. T.	A	—
31	26	Tuberculosis	T.	A	—
32	40	Locomotor ataxy	N. T.	C (1)	+
33	26	Anæmia	N. T.	C (1)	+
34	23	Cerebro-spinal meningitis	N. T.	C (1)	—
35	19	Anæmia	N. T.	C (1)	+
36	25	Chronic nephritis	N. T.	A	
37	54	Cardiac disease	N. T.	A	
38	32	Chronic nephritis	N. T.	A	
39	29	Acute pneumonia	N. T.	A	—
40	13	"	N. T.	A	—
41	28	"	N. T.	A	—
42	50	Chronic nephritis	N. T.	A	
43	35	Acute rheumatism	N. T.	A	
44	64	Cardiac disease	N. T.	A	
45	48	Thoracic aneurysm	N. T.	A	—
46	39	Chronic Bronchitis	N. T.	C (2)	
47	31	Gastric ulcer	N. T.	C (2)	+
48	46	Diabetes mellitus	N. T.	C (2)	
49	54	Sigmoid tumour	N. T.	C (2)	
50	15	Tuberculous peritonitis	T.	C (2)	+
51	11 ¹ ₂	Broncho-pneumonia	N. T.	C (2)	
52	24	Bronchiectasis	T.	C (2)	+
53	43	Anæmia	N. T.	B (3)	
54	8	"	N. T.	B (3)	+
55	33	Gastric disease	N. T.	B (3)	—
56	47	Cardiac disease	N. T.	B (3)	
57	27	Gastritis	N. T.	B (3)	+
58	17	Rheumatic endopericarditis	N. T.	B (3)	
59	32	Acute pneumonia	N. T.	B (3)	+
60	12	Acute Bright's disease	N. T.	B (3)	
61	52	Cancer of rectum, &c.	N. T.	B (3)	
62	45	Chronic nephritis	N. T.	B (3)	
63	13	Otitis media	N. T.	B (3)	
64	53	Cancer of liver	N. T.	B (3)	
65	30	Nephritis	N. T.	B (3)	
66	16	Gastric ulcer	N. T.	B (3)	
67	5	Tuberculous peritonitis	T.	B (3)	
68	39	Anæmia	N. T.	B (3)	
69	3	Pseudo-hypertrophic paralysis	N. T.	B (3)	

No.	Years + age	Diagnosis.	Tuberculous (T), or non- tuberculous (N.T.).	Preparation used	Reac- tion.
70	50	Bronchitis	N.T.	B (3)	—
71	17	Chlorosis	N.T.	B (3)	—
72	1	Rickets	N.T.	B (3)	—
73	30	Cardiac and renal disease	N.T.	B (3)	—
74	51	Rheumatoid arthritis ..	N.T.	B (3)	—
75	57	Acute pneumonia ..	N.T.	B (3)	—
76	22	"	N.T.	B (3)	—
77	16	"	N.T.	B (3)	—
78	24	Cardiac and renal disease ..	N.T.	B (3)	—
79	38	Acute pneumonia	N.T.	B (3)	—
80	54	Chronic nephritis	N.T.	B (3)	—
81	30	Perniciou anemia	N.T.	B (3)	—
82	65	Acute pneumonia	N.T.	B (3)	—
83	35	Cardiac disease	N.T.	B (3)	—
84	27	Cerebral tumour	N.T.	B (3)	+
85	24	Mental disease	N.T.	B (3)	+
86	53	Cardiac disease	N.T.	B (3)	—
87	44	Filariid phthisis	T.	B (3)	+
88	33	Nephritis	N.T.	B (3)	—
89	27	Acute pneumonia	N.T.	B (3)	—
90	51	Aortic regurgitation	N.T.	B (3)	—
91	47	Paralysis agitans	N.T.	B (3)	—
92	12	Chorea	N.T.	B (3)	—
93	10	Cardiac disease	N.T.	B (3)	+
94	40	"	N.T.	C (2)	+
95	51	Gastric disease	N.T.	C (2)	—
96	64	Broncho-pneumonia	N.T.	C (2)	—
97	1 $\frac{1}{2}$	"	N.T.	C (2)	—
98	5	Cerebral disease	N.T.	C (2)	—
99	10	Chorea	N.T.	C (2)	+
100	28	Cardiac disease	N.T.	C (2)	—
101	52	Cardiac and renal disease	N.T.	C (2)	+
102	20	Hæmatomesis	N.T.	C (2)	—
103	20	Acute pneumonia	N.T.	C (2)	+
104	38	Mediastinal tumour	N.T.	B (3)	+
105	33	Gonorrhoeal rheumatism	N.T.	B (3)	—
106	26	Phthisis	T.	B (3)	—
107	38	Renal abscess	N.T.	B (3)	—
108	25	Anæmia	N.T.	B (3)	—
109	30	Pleurisy	N.T.	B (3)	—
110	51	Locomotor ataxy	N.T.	B (3)	+
111	33	Gonorrhoeal rheumatism	N.T.	B (3)	—
112	43	Cardiac disease	N.T.	B (3)	—
113	15	Acute rheumatism	N.T.	B (3)	—
114	13	Pleurisy	T.	B (3)	+
115	1 $\frac{1}{2}$	Chylous ascites	T.	B (2)	+
116	7	Chorea	N.T.	B (2)	+
117	10	"	N.T.	B (2)	—
118	34	Phthisis	T.	B (2)	+
119	42	Cardiac disease	N.T.	B (1)	—
120	30	Rheumatism	N.T.	B (1)	—
121	55	Pleurisy	N.T.	B (1)	+
122	25	Acute pneumonia	N.T.	B (1)	—
123	15	Aortic aneurysm	N.T.	B (1)	—
124	15	Myxœdema	N.T.	B (1)	—
125	14	Anæmia	N.T.	B (1)	—
126	21	"	T.	B (1)	+
127	54	Cardiac disease	N.T.	B (1)	—
128	28	Enteric fever	N.T.	B (1)	—
129	10	Acute nephritis	N.T.	B (1)	—
130	50	Paralysis agitans	N.T.	B (1)	—
131	55	Cerebral hæmorrhage	T.	B (1)	—
132	11	Pleurisy	N.T.	B (1)	—
133	20	Acute rheumatism	N.T.	B (1)	+
134	60	Stricture of œsophagus	N.T.	B (1)	—
135	50	Muscular atrophy	N.T.	B (1)	+
136	35	Gastric disease	N.T.	B (1)	—
137	48	Cardiac disease	N.T.	B (1)	—
138	10	Cardiac disease	N.T.	B (1)	—
139	10	Cerebral disease	N.T.	B (1)	—

REMARKS UPON THE TABULATED CASES.

Case 2.—Duration three weeks. *Cases 5, 31, 61, and 107.*—Patient died. Post-mortem examination. No tubercle. *Cases 7 and 130.*—Patient died. No post-mortem examination. *Cases 8, 17, and 118.*—Tubercle bacilli in sputum. *Case 9.*—Ptosis and dilatation of pupil in the tested eye. *Case 10.*—Old sacro-iliac disease. *Case 12.*—Patient died. No post-mortem examination. See reference in text. *Case 18.*—Reaction lasted 18 days. *Cases 22, 28, 46, 48, and 99.*—Tenderness at time of testing. *Cases 23 and 32.*—See reference in text. *Case 24.*—Patient died. Post-mortem examination. Tuberculous pleurisy. *Case 35.*—Reaction lasted 3 weeks. Granular conjunctivitis and drooping of upper lid. *Case 38.*—Anæmia. Patient died. No post-mortem examination. *Cases 47, 78, 95, 98, 109, and 115.*—Anæmic. *Case 52.*—Marked reaction. Granules on both palpebral and bulbar conjunctiva. *Case 57.*—Granular elevations on bulbar conjunctiva. *Case 62.*—Anæmic. Patient died. Post-mortem examination. No tubercle. *Case 64.*—Conjunctival ecchymosis. See reference in text. *Case 65.*—Reaction granular conjunctivitis. *Case 68.*—Reaction relapsed. *Case 75.*—Quiescent cicatricial trachoma. *Case 80.*—Chronic conjunctivitis present. *Case 83.*—Anæmic. Patient died. Post-mortem examination. No tubercle. *Cases 85 and 86.*—Nebulae present. Reaction relapsing. Granular elevations on bulbar conjunctiva. Phlyctens. *Case 89.*—Old corneal nebulae. *Case 93.*—Both eyes a little tender at time of testing. *Case 106.*—Tubercle bacilli in sputum. Does not belong to late stage. *Case 110.*—Reaction occurred on third day. *Cases 113 and 114.*—Solution used was 24 hours old. *Case 131.*—Patient died. Post-mortem examination. Healed tubercle in lungs. *Case 135.*—Optic neuritis in the tested eye before applying the solution.

CLINICAL AND PATHOLOGICAL MEMORANDA.

NOTES ON A CASE OF CEREBRAL ABSCESS FOLLOWING ORBITAL INJURY

BY

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Miss B., aged 24 years, was sent to me by Dr. O'Keefe, of Griffithstown, Mon., on February 9th, 1904, for advice with regard to a swelling in her left orbit. She gave the following history. In August, 1903, she fell from her bicycle cutting her face and driving a piece of stick, described as forked, with prongs 1 to 1½ inches long, into her left orbit through the upper lid. This was removed, and the cuts healed well, but the accident was followed by convergent squint, with diplopia, which disappeared in a few weeks, by so-called bilious attacks, i.e., headache and vomiting, and by the formation of a swelling in the orbit, which varied in size and got dusky at times. On examination, a swelling, as large as a hazel nut, was found in the upper and outer angle of the left orbit, apparently connected with the periosteum. This was not tender on pressure, and showed no signs of fluctuation. The ocular movements and fundi were normal, but there was slight ptosis on the left side. Fomentations and general treatment were prescribed. On February 18th I again saw the patient when there was evidently an abscess pointing. This

was opened, and a piece of stick, $\frac{1}{2}$ inch by $\frac{5}{32}$ inch, came away from it, while on probing, a small piece of dead bone was felt at the outer end of the orbital margin. The cavity was drained, and healed up, the bone becoming covered, and the patient went home.

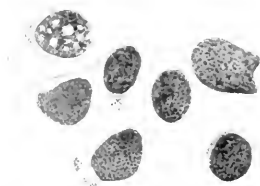
I next heard of Miss B. in June, 1904 (*i.e.*, three months later), when Dr. O'Keefe wrote asking me to take her into the Newport and Monmouthshire Hospital, as she had begun to get ill again a few weeks after her return home, and had since developed cerebral symptoms. She was admitted on June 18th, 1904, when her condition was as follows.—She lay in bed quite apathetic and motionless, answered when spoken to, but only after a pause and with evident effort. She did not recollect any recent events. Her tongue was coated, her pulse 80, and her temperature varied from 97° F. to 98° F. She had most obstinate constipation. Both eyes were proptosed, the left more so than the right, and the left external rectus was paralysed. Both fundi were congested, with some hæmorrhage, and the discs projected 1 mm. The dull, stupid, heavy aspect of the face was most marked.

On June 22nd, 1904, after a consultation, my colleague, the late Dr. Paton, trephined the skull on the left side $1\frac{1}{2}$ inches behind the external angle of the orbit. On removing the bone there was no pulsation and no pus under the dura mater. An exploring needle was passed inwards and slightly forwards into the frontal lobe for $1\frac{1}{2}$ inches when a large quantity of pus was found. The abscess was drained. On June 24th, the drainage tube came out and could not be replaced. Two days later the patient began to look about her when it was noticed that she had right facial paralysis. On June 28th, the patient was again duller and her temperature had risen to 100° F. Under an anæsthetic, the drainage tube was replaced and it was found that pus had again accumulated. On July 3rd, the discharge had ceased, and the drainage tube was removed. The patient went on well with complete absence of sickness and headache until July 9th, when she became drowsy and vomited. On exploration, no pus could be found at the site of the abscess. The patient gradually got worse until the next night when her right arm and leg began to twitch and her temperature rose to 100° F. She was anæsthetised at 11 p.m. on July 10th, and a needle, passed from the original trephine opening in the direction of the motor area for $2\frac{1}{2}$ inches, tapped an abscess from which a large quantity of pus came away. Next day the patient was conscious and had no more twitchings, her temperature being normal and her pulse 88. She talked quite rationally and cheerfully, but complained of sleeplessness. From this time on she steadily improved, the facial paralysis disappeared, and by August 16th the left external rectus had regained its power. On August 26th she was discharged, her general condition being very good, while the trephine wound was healed with the exception of a small granulating surface.

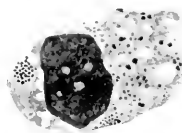
On September 26th the patient was seen again, when she had slight proptosis of the left eye, the retinal hæmorrhages had completely disappeared, and the optic discs were quite flat and of a good colour, but the retinal vessels were very slightly congested and there were white streaks along some of the veins. The central vision in both eyes was normal. The white fields were quite full, but the fields for red and green were concentrically contracted twenty degrees.

Since then the patient's excellent condition has been well maintained. She was examined on April 28th, 1909, when she said that since her previous visit she had been quite well and able to do anything she liked, but she avoids violent exercise. Her central vision was normal in both eyes, her white fields were full and her colour fields the same as at the previous testing. There

EPITHELIAL CELLS OF TRACHOMA WITH CORPUSCLES. PRAWOZEK.



CELLS OF CHALAZION.



To illustrate Dr. G. STANCULEANU'S article on Trachoma.

were narrow white bands along the edges of the large retinal veins definite in the left eye, but barely perceptible in the right, which gave one the impression that they were situated in the choroid and not due to change in the walls of the vessels. The fundi were otherwise normal, and there was no defect in the movements of the eyes.

TRACHOMA: A CONTRIBUTION TO THE STUDY OF ITS ÆTIOLOGY.

BY

DR. G. STANULEANU,

BUCAREST, ROMANIA.

It has been assumed of late that the ætiology of trachoma has been discovered. Prawozek, Greeff, Clausen, and Mijachita have described cases of acute trachoma in which spherical or oval formations were found having a granular aspect. They were situated in the protoplasm of the epithelial cells, close to the nucleus. I have tried to test these assertions in a considerable number of cases of trachoma at the Coltzea Hospital, and employed the following *technique*.—Having scraped the surface of the conjunctiva, the product thus obtained was spread on several glass slides, and then stained by the modified Leishmann method, which consists in first fixing in methylic alcohol, and then staining for twenty minutes in a solution composed of 1 c.cm. Leishmann and 2 c.cm. of a mixture of glycerine and distilled water of the strength of one in forty. In all cases of acute trachoma I have found among the normal conjunctival epithelial cells other cells whose protoplasm contained spherical or oval formations, which could be stained blue or purple, like the nucleus. Some of these granulations seem to be surrounded by a halo. In these groups the granulations are either detached or have the shape of the diplococcus. As a rule, there is only one group in each cell next to the nucleus. When there are two or more, they are situated at the opposite poles of the nucleus. Their characteristic feature is their intimate relationship to the nucleus.

By this procedure I have found formations which have not been described by any of the foregoing authors. In the epithelial cells one could see next to the nucleus a group of granulations having a prolongation which seemed to be made up of a longer granulation. There are other cells in which all the protoplasm is taken up by these granulations. The cell has then no longer distinct limits, and all around it I have noticed scattered granulations having, as a rule, the shape of the diplococcus. In chronic trachoma, the oval formations, which have been described, are very seldom to be met with. In most cases the epithelial cell and its corpuscles have no longer limits, and its free corpuscles are very numerous.

In the other diseases of the conjunctiva I have not noticed these formations, although I have made special investigations in follicular conjunctivitis. In cases of chalazion, however, I have found formations which slightly resembled the granulations of trachoma, but differed from them, in that the granulations were more or less longer and the shape a perfectly rounded one. These formations are scattered in the protoplasm of the cells, and seldom form compact body groups. They can be stained pink with Giemsa.

SOME RECENT FIGURES RELATING TO OPHTHALMIA NEONATORUM IN GREAT BRITAIN.

BY

SYDNEY STEPHENSON,

LONDON, ENGLAND.

IN view of the interest now being taken in ophthalmia neonatorum, it has occurred to me that a useful purpose might be served by placing upon record certain recent British figures dealing with the prevalence and results of the disease. For some of the figures that will be quoted I am indebted to Miss Edith Wright, the energetic organizing secretary of the North of England Union of Institutions, Societies, and Agencies for the Blind.

The figures refer to:—(1) prevalence, and (2) results of the disease.

1. Prevalence.—Since ophthalmia neonatorum is not as yet notifiable to the local sanitary authority, and is, of course, not fatal, it becomes extremely difficult, and perhaps almost impossible, to obtain any trustworthy idea with regard to its prevalence among the population generally. Statistics from Lying-in Hospitals and Poor-law Maternity Departments are available. Thus, amongst 35,815 births in six British Lying-in Institutions from which I obtained returns a couple of years ago, the incidence of ophthalmia ranged from 0·04 per cent. to 0·69 per cent., and averaged 0·22 per cent. (*Ophthalmia Neonatorum*, 1907, p. 4). This creditably low proportion, however, should be regarded merely as indicating that, by proper management, the incidence of the disease can be reduced to a very low point. The figures from Poor Law Maternity Departments tell much the same tale. By the kindness of Dr. Andrew Fuller, medical inspector of the Local Government Board, I was enabled a year or two ago to secure figures from almost all the English and Welsh towns and cities of which the population exceeded 100,000. The returns were in all cases from responsible medical practitioners, and, upon the whole, can, I think, be depended on. They are as follows—Among 17,579 babies born alive, there were 128, or 0·72 per cent., cases of ophthalmia neonatorum.

Although, as already stated, there is no notification of ophthalmia in the proper sense of the word, yet under the rules of the Central Midwives Board, "inflammation of the eyes, however slight," is a condition in which the midwife is bound to summon the services of a registered medical practitioner, and whenever this has been done, the fact must be notified to the so-called "local supervising authority" within twenty-four hours at the latest. This provision should enable us to get some idea of the prevalence of ophthalmia among the class of confinements likely to be attended to by a midwife, although apparently not many figures are at present available. Then, too, the prescribed form may not be filled up properly. For example, it may be vaguely stated that medical help was summoned "on account of the child" without specifying the particular condition, such as birth injuries, malformations, feebleness, skin eruptions, inflammation about the navel or of the eyes, for which help was required. Dr. Edward Sargeant, Medical Officer of Health for the County Palatine of Lancaster, has stated that the midwives under supervision in his district attend something like 20,000 births per annum, and that during 1907 and 1908 very few cases have come to his knowledge where inflammation of the eyes has been noticed during the ten days in which the midwives remain in attendance. He has been informed that during the two years the inspectors of midwives have personally examined "about 400 newly-born babies, and in only eight cases has inflammation of the eyes been noticed." This amounts, however, to 2 per cent. Calculated on the 2,318,525

births registered in the United Kingdom during 1906 and 1907, this would mean no fewer than 46,370 cases of ophthalmia neonatorum, and assuming damage to the cornea in one-fifth of the patients, the malady would be responsible for partial or complete blindness in 9,274 children. Surely matters are not so bad as this in England!

The Notification of Births Act, 1907, provides that notice of birth shall be conveyed in writing to the medical officer of health of the district in which the child is born within thirty-six hours after the birth. The Act applies to all parts of the United Kingdom; but its adoption, unfortunately, is optional as regards any particular local authority. On notification, the health authority in many places sends a lady sanitary inspector to the house, and in some instances knowledge concerning ophthalmia neonatorum is disseminated by these means. The lady visitor would naturally ascertain whether the baby's eyes were inflamed, and if so, report the fact to the medical officer of health. The symptoms of the disease, however, do not commonly appear until the second or third day after birth, and this probably accounts for the fact that in Newcastle-upon-Tyne in a series of 1,399 births, only four cases of ophthalmia were noted by the lady health visitors.

Mr. N. Bishop Harman (*Medical Press and Circular**, April 14th, 1909) attempted to ascertain the incidence of ophthalmia by enquiry from the medical men who practised in a middle-class district of London. In this way he obtained statistics of 15,000 live births, and among these the incidence of the disease averaged 0·87 per cent., and of injury to the eyes of the infant from the disease, 0·047 per cent. Mr. Harman concluded "that of every 100 children born one contracts the disease, and of every 2,000 born, one is blinded or partly blinded by the effects of the disease."

2. Results.—The Royal Commission on the Blind, the Deaf, and the Dumb, which reported in the year 1889, estimated that about 7,000 persons in the United Kingdom had lost their sight from ophthalmia neonatorum. Mr. Stephen Mayou (*Medical Press and Circular*, December 16th, 1908) has calculated from the census returns for England and Wales that there are now about 3,000 children under the age of fifteen years blinded by ophthalmia neonatorum, and Mr. N. Bishop Harman (*Medical Press and Circular**, April 14th, 1909) from similar data that in 1901 there were from 1,000 to 2,000 living persons who were blind from purulent ophthalmia occurring at birth. It is, however, obvious that these estimates are of an approximate character only, and should be accepted as such. It would, in my opinion be unwise to attach too much importance to them.

A more trustworthy source of information is to be found in the Blind Schools and Asylums, although here, too, certain fallacies must be borne in mind when attempting to estimate the value of the figures. First, we have to consider the trustworthiness or otherwise of the returns; secondly, the institutions, which are intended for young persons, cannot give information as to the proportion borne by blindness caused by ophthalmia neonatorum to blindness in general; and, thirdly, no conclusion can be safely drawn as to the ratio borne by the number of pupils to the total population of a given locality.

Mr. Simeon Snell (*British Medical Journal*, November 2nd, 1907) enquired into the cause of blindness in 321 inmates of the Sheffield School for the Blind, and found that ophthalmia neonatorum accounted for 130, or 42·29% of the total. Between the years 1903 and 1906 Mr. N. Bishop Harman (*Preventable Blindness, 1907*) examined 363 children in the schools for the blind maintained by the London County Council. He found, as the result of

*For abstract see p. 444 of the present number of THE OUTHAM REVIEW.

his enquiries, that 132, or 36·6% owed their condition to infantile ophthalmia. Mr. Harman declared that if certain fallacies were given due weight, "the percentage of blindness from ophthalmia neonatorum would exceed 40 per cent." Mr. Stephen Mayou (*Practitioner*, 1908, p. 130) ascertained by enquiry from the medical officers attached to British Blind Schools that of 2,569 inmates, all below the age of eighteen years, 706, or 27·48%, were blind from ophthalmia neonatorum.

Dr. Robert N. Hartley, of Leeds, inspected "nearly 200 children in a blind school, and found that 44 (about 25%) had suffered from purulent ophthalmia (*Report of a Conference held at York on May 15th, 1907*, p. 25). Dr. Draper (*Ibidem*, p. 29) speaking of the Yorkshire School for Blind at York, stated that during the last ten years medical certificates of new-comers gave purulent ophthalmia, or ophthalmia neonatorum, as the cause of the blindness in no less than 27·6% of the total admissions. This information has been confirmed by Mr. A. B. Norwood, M.A., superintendent of the school in question. "Out of 150 pupils," he writes, "whose names are on the school register from January, 1897, to December 31st, 1906, 41 are described as owing their blindness to ophthalmia neonatorum, making in our case a percentage of 27·6" (*Private communication dated March 11th, 1909*.)

Dr. George Foggan has quoted some recent figures from the Royal Victoria School for the Blind at Newcastle-upon-Tyne, to which he is attached as ophthalmic surgeon (*The second Annual Report of the North of England Union of Institutions, Societies, and Agencies for the Blind*, May 15th, 1908). They are as follows:—During seven consecutive years the disease accounted for the annexed percentages of the new admissions—1902, 36·6 per cent.; 1903, 39·1 per cent.; 1904, 37·1 per cent.; 1905, 35·8 per cent.; 1906, 36·4 per cent.; and 1907, 31·6 per cent. The average of Dr. Foggan's figures was 36·1 per cent.

Lastly, figures given by Dr. Charles H. B. Shears dealing with all the blind workers at the Liverpool Workshops for the Outdoor Blind may be quoted (*Private communication dated March 28th, 1909*). Amongst 98 males 15 had been blinded by ophthalmia neonatorum; amongst 29 females 9 had been blinded by the same disorder. In other words, ophthalmia neonatorum was responsible for blindness in 24 cases—that is, in about 18 per cent.

NOVELTIES.

THE DIAPHRAGM TEST FOR BINOCULAR VISION.

BY

N. BISHOP HARMAN, M.A., M.B. (Cantab.) F.R.C.S. (Eng.)

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THIS test is one of rare simplicity, and yet one that will elicit a surprising amount of information when applied in practice.

It is simple, because it rests upon a phenomenon which is of every day occurrence. On looking out of a window the man who has natural binocular vision sees more widely than does the man who has only one eye, or who sees with but one eye at a time.

The instrument,* shown in fig. 1, has been designed to emphasise this natural phenomenon. The relative positions of the test object, the screen with the single hole in it, and the patient's eyes are such that the man with normal

*Made by Messrs. George Culver, Ltd., of White Lion Street, London. Reg. No. 537830. It costs only a few shillings.

vision gets binocular vision for a narrow median band of the test card, and monocular crossed vision for the lateral wings of the card (fig. 2.). The central band of binocular vision is enough to secure a perfect balance in the eyes of those who have a minimum sufficiency of binocular fixation, or a minimum development of the fusion faculty. But with those who have not this minimum of muscle balance the wandering movement of the eyes is at once demonstrated by what appears to the patient as an alteration of the test object; and, to the surgeon, who is watching the eyes of his patient, by an abnormal movement of the eyes.

Using the Instrument.

The patient should place the free end of the instrument against the upper lip (it is washable), and hold the handle with *both* hands. The surgeon holds the small free piece behind the test rack to steady the instrument.

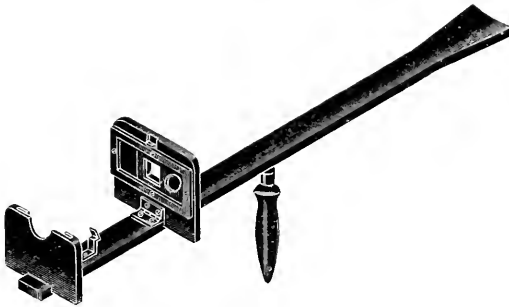


Fig. 1.—Length of base board 44cm. Rack to diaphragm 11cm. Size of hole 1.7cm.

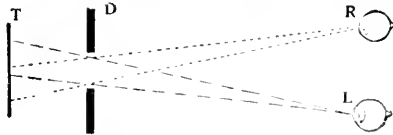


Fig. 2.—Paths of vision through the hole in the diaphragm (D) to the test card (T).

The surgeon should not fail to watch the patient's eyes during the whole time of his examination, he will learn as much, often more, by noting the movements of the patient's eyes than he will by his answers.

The test cards are numerous, and include printed matter of all sizes, pictures for children, and coloured patches for use where by reason of poor visual acuity the colour-sense is more emphatic than the form-sense, and the test cards should be well illuminated.

Employment of the Test.

The test is of value for the following purposes:—

1. To determine the equality of visual acuity in the two eyes
2. To determine the presence, the absence, or a defect of binocular vision
3. To exercise the vision in squinting eyes.
4. To detect malingerers feigning monocular blindness.
5. To demonstrate certain physiological phenomena connected with the perception and suppression of images.

1. Equality of visual acuity of the two eyes.

Fig. 3 shows the appearance of a test card with the position of the crossed images of the square hole of the diaphragm marked upon it, the left part of the print is seen with the right eye, and *vice versa*; and the middle band with both eyes. It is obvious that any lack of inequality in the acuity of the eyes will be at once detected by the patient. I find that a variation of 0.25D. can be perceived.

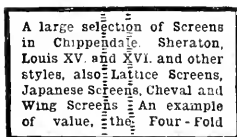


FIG. 3.

2. Binocular vision and its defects.

The phenomena produced by the various orders of latent squint can be best shown by the use of the test card with a single line of letters or figures:—

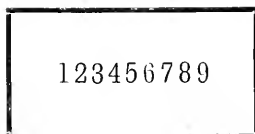


FIG. 4.

The man with good binocular vision reads this line straight off with ease, 1 2 3 4 is seen with the right eye, 6 7 8 9 with the left, and 5 with both eyes.

In convergence (esophoria) the middle letters are overlapped and suppressed, so that the man reads something like this:—

126789

In divergence (exophoria) the middle letter is re-duplicated, and the man reads:—

12345 56789

In vertical displacement (hyperphoria) the parts of the line of letters seen by each eye are on different levels, thus:—

12345
56789

The surgeon who has good binocular vision can himself see these phenomena by using prisms, or by slightly displacing one eye with the push of a finger.

This test is the most rapid and easy mode yet discovered of demonstrating heterophoria. It requires no explanation to the patient. The interpretation by the surgeon requires no complicated thought. It is so natural that small children can be examined with it, the picture test cards provided (fig. 5) are

an attraction to them. Pictures, such as these, can be increased by cuttings from any picture book. My youngest patient, so far, is a girl of 2 years



FIG. 5. One of the children's test cards.

5 months, who correctly named the six pictures and 2 coloured tests set in the rack of the test, and asked for more!

3. Exercises for squinters.

It is obvious that the test will supply a want in the training of eyes, the vision of which has been reduced by squint. Monocular alternate fixation, and binocular fusion can be practised through a series of graded tests. A specially cheap form of instrument with test cards is made for this purpose.

When one eye by reason of disease has a lesser visual acuity than the other, the superiority of the better eye can be reduced by paralysing the accommodation of the eye with atropine, by shading the half of the tests to be seen with that eye, or by placing such a glass before that eye as will reduce the vision to an equality with the weaker eye.

Detection of Malingerers.

It is a well nigh perfect test for this purpose. It is almost impossible for the most expert of rogues to escape detection, and it is so simple that the surgeon runs no risk of being involved in his examination.

There is no objection to the patient seeing all the test cards laid out on the table beforehand. And even when the eyes differ in visual acuity the test can be applied, for the coloured patches can be discerned when form cannot.

There are test cards with squares printed thereon: coloured red and green, or black for use with the colour blind. The squares are printed right and left, and on different levels, so that convergence cannot fuse them. The cards are reversible, the red and green cards can be exhibited four different ways: red to the right, to the left, above, or below.

One of these cards is put in the rack, and the patient asked what he sees. 1. He may be told to look through the hole; then he sees the patches as they

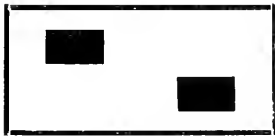


FIG. 6.

Arrangement of test card with red and green patches.



FIG. 7.

The same test card seen through a diaphragm which causes crossed vision, the patches appear as in Fig. 6. The pointer-printing is on the left side of the card.

are on the card, and must name them. Suppose—an extreme improbability—the man knows the patches are seen by crossed vision, and correctly evades

naming the patch seen by the pseudo-amaurotic eye, yet he does not escape, for the surgeon, watching his eyes, will see the *co-ordinate movements of the eyes as he looks from one to the other area of crossed vision*. A man truly blind of one eye does not do this. In fact the occurrence of this co-ordinate movement of the eyes is so definitive, that it is not necessary to invite the man to perjure his soul by requiring an answer by his mouth—the true answer is given unconsciously by the movement of the eyes!

2. The man may be told to look at the pointer projecting into the hole of the diaphragm, then he gets homonymous diplopia for the distant patches, and one appears plumb above the other (fig. 7). Seen thus it is impossible to guess whether one or both eyes take part in the vision of the patches, even the cards may be changed so that red is seen by right and left eyes alternately without the change being detected.

5. Physiological alternation of vision.

One test card is of interest as a physiological experiment. One half has thereon the cross of St. George, the other the cross of St. Andrew (fig. 8).



FIG. 8.

With the test in the rack and the eyes fixed on the pointer projected into the round hole of the diaphragm, certain phenomena can be obtained when there is perfect binocular vision and equality of vision. For a moment the crosses are superposed and an eight point star is seen; but the appearance of the star is not constant for the whole time of the observation, there succeeds an alternation in the perception of the images seen by the right and left eyes, so that as though by an electric flashing sign the crosses of St. George and St. Andrew pulsate upon the screen.

The explanation of this phenomenon would appear to be as follows.—Since in perfect binocular vision the two maculae and the two halves of the brain have learned to view and perceive but one object of fixation at a time, the brain is now incapable of retaining constantly the perception of two dissimilar objects seen by the two maculae. The brain does it for a moment, and at the instant of the first attempt, but then comes a struggle between the two maculae and the two sides of the brain, each alternately obtaining and losing the perception of the object presented to it. There obtains a sort of primitive separated condition of the visual apparatus.

Conclusion.

In conclusion, I venture to suggest that the "Diaphragm Test" puts a very useful and handy every-day servant in the hands of the ophthalmic surgeon, one that will tell him many secrets with a minimum of explanation and direction to the patient; and finally that the test is not unworthy to be considered one of the simplest methods for the experimental demonstration of binocular vision.

REVIEW.

EYE INJURIES IN THEIR RELATION TO THE WORKMEN'S COMPENSATION ACT.

BY

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When a surgeon is called to give expert testimony in court it must be assumed that his evidence is calculated to assist the arbitrator in estimating the *legal* liabilities of the employer in cases of injury to the workman.

The surgeon's personal and private opinion with regard to the humanitarian and equitable aspects of the case must be made subservient to the legal point of view, otherwise it is more than likely that the opinions on the case will be as numerous and as conflicting as the number of experts.

It is, therefore, necessary that the surgeon should understand the essential principle of the Workmen's Compensation Act.

Briefly, then, it must be understood that according to these Acts a workman injured whilst at work is legally entitled to a certain proportion of his weekly wages during the period of disability. When this disability ceases and the patient returns to his former work, or to any other work at the same rate of wages, the weekly payment ceases. The employer can only be made to continue the payments, in full or in part, by the workman proving to an arbitrator that he is not able to earn the same amount of money that he did before he met with the accident.

The liability of the employer for half the weekly wage during the period of total incapacity is seldom disputed, and the recognised amount is paid without any reference to an arbitrator. Legislation generally arises over the question of the workman's capacity for work after he has recovered from the immediate effects of the injury, and as Sym¹ remarks "the medical witness must bear in mind that the question depends upon the *ability* of the patient to work, not upon the wisdom or unwisdom of his continuing to follow a given dangerous occupation; of that point the law naturally takes no cognisance.

In this connection, however, it would be more correct to say the question depends upon the wage-earning ability of the worker, as working ability and wage earning ability are not necessarily synonymous, as we shall show later. In order to assist the arbitrator in estimating the wage-earning capacity of the workman the surgeon ought to be able to tell the judge what kind of work the claimant is able to do, what the conditions are under which he can do the work, whether he can do it in the ordinary time and with the usual degree of comfort, and whether his wage-earning capacity is likely to be altered in the future as a direct result of the injury.

In English law no cognisance is taken of the worker's loss of time, prospects and ambitions, pains, mental anguish, expense of illness, or any kind of "moral and intellectual damages."

Neither is the probable progressive increase in wages between the ages of 20 and 60 years taken into consideration any more than a probable diminution in the case of injury to a man 65 years of age.

Some American authors² base compensation on the assumption that a workman should double his income every ten years. The prospect of such an increase would gladden the heart of most British workmen, and that of most

a few professional men. In any case, it would avail nothing in a claim for compensation under English Law. As to whether the Workmen's Compensation Acts, as they now stand, can be altered so as to diminish the number of legal actions, we shall consider that later.

REFERENCES:

1. **Sym** : Compensation for injuries to the eye, *Ophthalmic Review*, October, 1906.
2. **Hansell and Sweet** : *Diseases of the Eye*, p. 500.

Visual Acuity.

In the estimation of wage-earning ability, visual acuity, before and after the accident, is a very important matter, though it is by no means all-important unless it is reduced below the minimum required for the claimant's work. The minimum vision required for individual trades is a question which has not been extensively worked out in England, and requires further consideration by the profession.

The classification of trades, according to their visual demands, has been carried out by several Continental and American observers, e.g. :—

Würdemann¹ divides workmen into two classes :—

Visual Demands.

1. Skilled (including members of the higher professions, engineers, iron and steel workers, machinist, etc.) $\frac{3}{4}$ to $\frac{1}{2}$
2. Unskilled labourers, miners, glassblowers, quarrymen, brickmakers, etc.) $\frac{1}{2}$ to $\frac{1}{10}$

De Micas classifies occupations into those requiring :—

1. Superior visual acuity (mechanics, jewellers and watchmakers.)
2. Good visual acuity.
3. Ordinary visual acuity (masons, labourers, etc.), besides placing in special classes those in which full physiological vision ($\frac{6}{6}$) is demanded (ultravision occupations), and those in which the vision demanded is fixed by regulations (army and police, etc.).

He does not define what he means by superior, good and ordinary vision, but he agrees with Groenouw that working vision may be regarded as normal as long as physiological vision does not fall below $\frac{1}{2}$. When physiological vision falls to $\frac{1}{10}$, professional acuity is regarded as $\frac{8}{10}$, likewise $\frac{7}{10}$, $\frac{6}{10}$, and physiological vision of $\frac{1}{10}$ professional acuity of $\frac{1}{10}$. These rules do not apply to ultravision occupations or to occupations in which visual demands are fixed by regulations. While $\frac{1}{2}$ is generally admitted to be full working acuity, there is considerable diversity of opinions with regard to the lower working limit. Trucl² estimates that $\frac{1}{10}$ is the minimum visual acuity necessary for the provision of the elementary necessities of life—the superior limit of blindness. De Micas³ agrees with this, notwithstanding the fact that the French ministerial authorities have reduced the minimum visual acuity for active and auxiliary services to $\frac{1}{20}$. Groenouw⁴ has also shown that many patients with vision of $\frac{1}{20}$, and one-eyed at that, can earn full wages at certain occupations. Fergus⁵ records two cases of retinitis pigmentosa, where the best vision in one was counting fingers at one foot and $\frac{1}{10}$ in the other, and yet they were able to earn nearly full wages as coal-miners. In most of the other cases recorded by him the sight of one eye had been entirely lost, and in many of them the vision of the remaining eye was greatly impaired, and yet all were earning full wages as blacksmith, boiler-maker, engine fitter and other forms of ironwork, miners, etc.

Several observers, Magnus, Schroeter, Heddaeus, Groenouw, Berry, Percival, etc.) have endeavoured to estimate the loss of efficiency caused by visual defects by means of mathematical formulae. Such formulae may be of some

service to the individuals who formulated them, as they represent their own opinions and point of view, but they can be of little value for general use. Berry's criticism, though directed to the German formula, seems applicable to them all. He says, "they are unnecessarily complicated. They do not lend themselves readily to the construction of tables as there are too many variables, and some of the factors introduced cannot be said to be of sufficient importance. Besides, such formulæ aim at a degree of precision which is surely, under the circumstances, altogether undesirable, not to say ridiculous." And yet Berry, while taking into consideration acuteness of central vision only—very often not the most important factor in the case—gives us the following formula:—

$$E = (1-V^2) \frac{M(S + S_2(1-S) - 2-S)}{M + S + 2} + V^2$$

where E represents the efficiency, S is the sum of V and V², the visual acuteness in the two eyes, and M is an arbitrary coefficient varying with the supposed influence of the loss of one eye upon the visual efficiency for the particular kind of work done. No formula, however complicated, could possibly include such important factors in the estimation of compensation, as the intelligence and perseverance of the patient, the work, state of the labour market, the prejudices of employers and employed, etc., to say nothing of visual factors other than visual acuity. It may be remarked here that the prevailing custom of denoting reduction of vision by vulgar fractions such as $\frac{1}{2}$, $\frac{1}{3}$, $\frac{1}{4}$ is very unsatisfactory. To a layman (judge, etc.), the reduction of the sight of one eye to $\frac{1}{4}$ sounds a very serious affair, and tends to make him allow substantial compensation in a case where there is little or no diminution in wage-earning capacity. It is highly desirable that we should possess some uniform but more accurate method of expressing the depreciation of sight.

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Limitations of the Visual Field and Muscular Defects.

These two factors, though not as a rule of the same relative importance as central visual acuity, may, in exceptional cases, be the main factors in deciding the question of compensation.

In actual practice, it is seldom necessary to consider the question of *limitation of field*, as even when one eye is lost the diminution in its extent only amounts to one-sixth of the binocular field. Magnus, Schroeter, and Groenouw⁶ allow that loss of the nasal field in one or other eye, or a temporal contraction of less than 15° on one or both sides, causes no reduction of working capacity. These authors estimate the loss of the temporal field in one eye at a reduction of 10 per cent., and in two eyes at 20 per cent. of the working capacity. Homonymous hemianopsia is estimated at 40 per cent. reduction, while contraction of both fields to 30° is estimated at 45 per cent. to 50 per cent. Contraction to 5° from fixation point is considered to abolish working capacity altogether (100 per cent. reduction), by Magnus and Groenouw, and to reduce it 75 per cent. by Schroeter.

Berry¹⁰ estimates the loss from homonymous hemianopsia at one-third. Percival¹¹ would distinguish between right and left hemianopsia, as reading and

writing with the former is much more difficult than with the latter. His estimate of the reduction of working capacity is one-third in left hemianopsia, and one-half in right hemianopsia if the patient is employed in pursuits where reading and writing are necessary.

These estimates appear to the reviewer to be too high, as homonymous hemianopsia, unless there is loss of binocular vision or marked reduction of both visual acuities, does not, as a rule, reduce the working capacity, though it may reduce the wage earning ability in some cases owing to the possibility of increased risks of personal damage among machinery, etc., and the consequent restriction in the number of occupations open to the workman.

Muscular defects are more serious, as the diplopia and vertigo, resulting from oculomotor paralysis, generally compel the workman to wear an obturator, and, therefore, for working purposes the man must be regarded as one-eyed. Magnus estimates that there is a reduction of 25 per cent. in working capacity in the case of unilateral oculomotor paralysis. Groenouw estimates it at 40 to 10 per cent. if the occupation does not demand binocular vision, and 33 per cent. to 20 per cent. if binocular vision is essential. Paralysis of the muscles of both eyes is estimated at 20 per cent. to 60 per cent. reduction, according to the number of muscles involved, and 60 per cent. to 67 per cent. reduction is allowed for paralysis of all the muscles of a working eye. Such refinements are, fortunately, seldom necessary in practice, and the questions generally to be decided are whether the patient has binocular vision, and if not whether binocular vision is essential at his work.

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Binocular and Monocular Vision.

The relative usefulness of binocular and monocular vision is a fertile source of discussion. It is a subject which appeals to the judicial mind, and experts have been encouraged to make much of it in their evidence. The opinions on the value of binocular vision are varied. Some will have it that there are few occupations in which a one-eyed man can be profitably engaged, while others think that with very few exceptions his working capacity is little if at all reduced. The first estimate is presumably based on the assumption that the loss of an eye entails the loss of appreciation of solidity and distances. The reviewer is inclined to think that too much has been made of this factor. Judgment of solidity and distances does not depend alone upon the formation of images on functionally corresponding parts of the retina; other factors concerned in that judgment, such as accommodation, convergence, and movements of the head remain to the one-eyed, and are generally cultivated to a higher degree of efficiency than in the two-eyed. Pfalz¹² and Tschermak have invented apparatuses to demonstrate the capacity of a patient for estimating distances, and the former finds that a patient who has lost one eye in infancy can estimate distances practically as well as a two-eyed person, and that people who lose the use of one eye later in life soon recover the power of estimating distances, though not as completely as when sight is lost in infancy. Marri¹³ finds that the sense of depth undergoes, with the lapse of time, a continuous and progressive improvement in individuals who are permanently monocular. In the majority of cases this appearance is in direct connection with the progressive increase of the field of relative accommodation which has been shown to occur.

Montelly¹⁴ also says that the indubitable criterion for the estimation of depth is the muscular sense in accommodative movements.

The sudden loss of function of one eye no doubt gives rise to a little awkwardness for some time, but, in people who are not advanced in years at any rate, it does not prove a permanent bar to fine and exacting occupations, as we know of highly skilled engineers, mechanics, jewellers, dentists, and even ophthalmic surgeons who only possess one eye.

Fergus¹⁵ points out that the loss of one eye does not interfere at all with the wheeling of a barrow or the use of a hammer or pick, and that with imperfect form vision one may strike a blow quite accurately. No list of occupations which demand binocular vision seems to have been compiled as yet, and the surgeon must decide whether its loss entails diminished wage-earning ability in each individual case; this is always the deciding factor according to English law. Continental and American experts seem to be unanimous in estimating the indemnity for the loss of an eye at 15 per cent. to 33 per cent., according to the class of work. De Micas¹⁶ supports this estimate on extra-medical grounds, such as the prejudices of employers against the one-eyed, and the possibility of the loss of the second eye, but he does not believe in a parallel diminution of aptitude for work consistent with such indemnity. He declares that the loss of an eye if the other is sound—gives rise to little or no diminution in working capacity. He further explains that these estimates do not represent legal damages, but rather an equitable humanitarian reparation for real losses, such as part of the visual field and stereoscopic vision. Amman, quoted by Bonnaud¹⁷, after comparing the wages, before and after injuries, in a large number of cases, concludes that this rate of indemnity is too high, and gives the following estimates:—

15 per cent.—20 per cent for the loss of an eye without apparent deformity.

20 per cent.—25 per cent for the loss of an eye with apparent deformity.

Wassiljew¹⁸ and Hummelschein¹⁹ have also followed up cases in which indemnity has been paid, and find that rate of indemnity is too high compared with the amount of disability. Wassiljew's and Bonnaud's¹⁷ estimates are much the same as those of Amman. Schleich's²⁰ estimate of loss of binocular vision is 10 per cent to 15 per cent. In this connection we may consider the economic effect of aphakia.

Practically, it may be assumed that aphakia in one eye is a bar to binocular vision. If, however, the patient is able to go about with his eye uncovered the aphakic eye has a considerable economic value, and in certain cases, such as porters, carters, etc., may be of more value than binocular vision with restricted visual field, and as long as it does not reduce earning capacity entails no right to compensation. Such a view is, however, generally opposed by Continental writers, e.g.:—

Haab and Pfluger²¹ estimate the loss at 15 % to 20 % (according to the work)

Schleich²⁰ " " 10 % to 15 % " " "

Axenfeld²² " " 10 % to 25 % " " "

Schleich estimates the loss from double aphakia at 50 %, while Kauffmann's estimate was 100 %. Bonnaud¹⁷ estimates the partial permanent incapacity at half the vision obtained after operation, e.g., if the vision in the aphakic eye is one-fourth, the incapacity is one-eighth. But if the vision is one-tenth or less, no professional value is attached to the aphakic eye.

The extent to which vision may be reduced in one or both eyes, without loss of binocular vision, varies in different cases according to the amount of vision in the better eye and other circumstances. In deciding the question of earning ability, the question of presence or absence of binocular vision should

be established by such tests as the diploscope, stereoscope, prism test, etc. A useful and handy test, which requires no special apparatus, and can be applied anywhere, is that described by Roche²³. As a general rule, vision in the more defective eye may be reduced to $\frac{2}{4}$, or even to $\frac{1}{60}$, except in cases of marked anisometropia, without loss of binocular vision.

The rate and extent of recovery of working capacity after the loss of binocular vision are influenced to varying degrees by the age of the patient, the question whether the sight was lost suddenly or gradually, and the intelligence, resourcefulness and perseverance of the workman. These are factors which can hardly be valued mathematically, but they deserve the attention of those concerned in the estimation of wage-earning ability after injuries.

In cases where one eye has been lost and the remaining eye is defective, the estimation of earning capacity is a little difficult. Several writers have given us tables of estimates. Würdemann²⁴ gives the following:—

Vision	Impairment of earning ability.
7	37·8
6	51·1
5	63·9
4	75·9
3	87·0
2	96·5
1·5	100

The rate is a little less in cases of occupations with lower visual demands, and in the case of the originally one-eyed. A slight reduction is also allowed after the first year. Schleich's estimates are a little lower than Würdemann's. De Micas²⁵ points out that age may be responsible for diminished physiological visual acuity, but he does not admit the workman's right to compensation on this score. He says, however, that the general tendency of experts is to allow 5 per cent to 10 per cent for the old age factor which not only diminishes visual acuity but renders the eye less capable of re-education when the injured man has to change his occupation.

The Relative Value of the Eye lost.

De Micas argues that the right eye has not a greater utilitarian value than the left, although popular opinion amongst the workmen is against this view. The left, owing to its position, is apparently more disposed to injury, but this does not contribute a reason for increased indemnity when the right is injured. The reviewer²⁶ has advanced the view that the right eye is the more useful of the two eyes to a right-handed man for the reason that alignment with the right eye is easier and the more natural than with the left eye, which often entails bringing the head into uncomfortable positions.

This view seems to find some support from a case recorded by Bourgeois,²⁶ in which a right-handed blacksmith had the vision of the right eye reduced to one-tenth, the left vision being normal. In some parts of his work, e.g., levelling up certain irregularities on a bar of metal—he was obliged to shut the left eye and use the right eye only. It was estimated that he suffered 45 per cent. reduction of working capacity.

Some useful rules in the estimation of working capacity are given by Dehenne and Bailliant²⁷ who classify occupations thus: 1. Occupations demanding good binocular vision—mechanics, jewellers, etc.; 2. Occupations demanding an extensive and continuous visual field (coachmen, carters, porters, navvies, etc.). The rules may be epitomised as follows. In the estimation of wage earning capacity the surgeon should take into consideration:—

(i) The diminution of visual acuity. Where this amounts to two-tenths or three-tenths there is no reduction of working capacity, and therefore no legal right to indemnity. In other cases the earning capacity varies with factor (i), the work, and the presence or loss of factors (ii) and (iii).

(ii) Binocular vision: This is always useful, but is indispensable in some classes of work. Its loss may mean new apprenticeship.

(iii) The extent of the field of vision for the two eyes. A full field and good simultaneous vision are always useful, and any reduction constitutes an infirmity, but is more particularly so in class 2. The difference between the two is very clearly shown in cases of successful operation for traumatic cataract in one eye. To those of class 1 it presents no particular advantage but in the case of those of class 2 (drivers, porters, etc.) it means a considerable increase in the efficiency of the workman.

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The legal obligation of a workman to submit to medical and surgical treatment is a thorny question which must be settled by the Court rather than the medical man. Lesoudier²⁸ says:—

1. The injured workman is obliged to allow himself to be treated. If the consequences of the accident are aggravated owing to want of care on the part of the victim who has not followed out the doctor's advice, the compensation ought to be calculated as if the aggravation had not taken place.

2. The patient may legitimately refuse operation unless it can be considered perfectly safe, causing no considerable pain and certain of good result. The latter conditions are so exacting that such promises can seldom be justifiably made.

De Micas²⁹ favours the decisions of the Courts of Aix and Rennes which affirmed the right of the workman to refuse operation however benign, but at the same time established that the employer should not suffer for that refusal on proof that the incurred condition is not the consequence of the accident, but due to the action or misdeed of the workman. In the event of a patient refusing treatment suggested by a surgeon, it is well for the latter to have a written declaration from the patient or his guardian accepting the entire responsibility for the consequences. Such a document will be a protection to the surgeon in case of complications such as sympathetic ophthalmia and may prove useful evidence in the event of the patient claiming compensation for conditions arising out of improper treatment.

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Sympathetic Irritation and Sympathetic Ophthalmia.

Short of sympathetic ophthalmitis we may find photophobia, lachrymation and easily developed fatigue follow an injury which has taken a more or less normal course of recovery. Such symptoms may diminish the workman's rate of work and earning capacity for a time, but they should not last more than a few weeks at most. Any such symptoms lasting for a longer period are suggestive of the necessity for removing the exciting eye or of some intentional irritation of the sympathising eye by the patient. When the symptoms seem genuine the employers are generally quite willing to give the workman a few weeks' rest.

Sympathetic Ophthalmia is such a dire complication that no surgeon should take upon himself the responsibility of retaining an obviously dangerous or even a doubtful eye. The time of onset of sympathetic ophthalmia is admittedly most variable and erratic, but the period of maximum incidence appears to be between the fourth and the tenth week after injury.

Preventive enucleation should be performed before this period in any doubtful case.

It is generally assumed that if enucleation of the injured eye is performed before any signs of sympathetic ophthalmia have appeared in the sound eye, its preventive action is certain. Randolph³⁰ however states that we can never be sure that sympathetic ophthalmia will be averted by enucleation of the injured eye.

Some surgeons, on the contrary, are of the opinion that early enucleation of the exciting eye will avert a developing sympathetic ophthalmia. In reply to enquiries by Dianoux,³¹ de Wecker, Galezowski, Dor, Badal, de Lapersonne, Truc, Troussseau, and Valude gave it as their unanimous opinion that there was no authentic case of sympathetic ophthalmia having developed later than the seventh week after preventive enucleation. Any inflammatory trouble arising in the remaining eye after this period must therefore be regarded as not of a sympathetic origin, as seven weeks must be regarded as a generous allowance for the latent or incubatory period of sympathetic ophthalmia.

Whether or not sympathetic inflammation can be set up by a badly fitting or a septic artificial eye is difficult to decide, but in any case we must agree with de Micas³² that such a complication can not be made ground for claim for compensation, as the wearing of an artificial eye cannot be regarded as a necessity.

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Traumatic Neuroses.

Hysteria and neurasthenia may result from more or less slight injuries, but they are very liable to be mistaken for simulation. de Micas³² holds that where the symptoms are mono-symptomatic, the case is probably one of simulation. Simulation of oculo-motor hysteria (contracture, blepharospasm, ptosis, nystagmus, strabismus, etc.), is almost impossible for any length of time.

Amaurosis and amblyopia are the most common manifestations of hysteria. As a rule the symptom is unilateral, the pupil reflexes and fundi are normal, but there is generally some disturbance of the visual fields. In hysteria there is retraction of the field for white, which is relatively greater than the retraction of the colour fields, which may be larger than the field for white. The colour fields are often inverted and may overlap each other. The fields in neurasthenia are often of the spiral type.

Along with purely ocular symptoms we expect to find general symptoms of hysteria or neurasthenia, and in cases of doubt it is well to call in a physician.

The prognosis of these cases is highly uncertain. It is generally assumed that they recover rapidly after the receipt of a sum of money as damages, and the reviewer is of the opinion that in some cases this view is justified, but, on the other hand, there are cases which do not improve at all under what might be called the "gold cure."

The tendency to relapse makes these cases most unsatisfactory to all concerned, and the patient with every apparent desire to recover, becomes depressed and good for nothing. When, however, the patient feels that he or she can do *some* work, it is just as well to let it be done.

Extra Medical Factors in the Estimation of Wage-Earning Capacity

It is necessary to remember that there are other factors, apart from visual acuity, fields and muscles, which enter into the question of wage-earning ability.

The state of the *labour market* may be a deciding factor in reducing the earning capacity of an injured worker. If there are two equally well-qualified applicants for a job, the man with signs or history of injury to the eye is likely to come second. The prejudices of employers in this respect must vary largely, and probably they are more adversely influenced by obvious disfigurement than by any unobtrusive deterioration of sight. For this reason an ectropion, or partial symblepharon, or an eccentric leucoma having no deleterious effect on sight or working capacity, may be more detrimental to a workman than detachment of retina showing no signs of injury but with loss of all useful vision.

The man who has obviously lost one eye is further handicapped in that insurance companies do not care to accept one-eyed workers at the ordinary rates, and may even refuse to accept them on any terms. The lot of such a man is very unenviable compared with that of a man with a squinting or amblyopic eye, although both are one-eyed as far as their work is concerned.

The *conditions of work* must be taken into consideration. It would be unwise to force a one-eyed man to work among unprotected machinery in motion, or to work on roofs or high buildings, where a slight error in the judgment of distances might lead to a serious, if not fatal, fall.

Conditions of lighting have also to be considered, as some may not be able to work in strong light, others may not be able to work in a feeble light, or *vice-versa*.

When these conditions cannot be acceded to, the quality or quantity (or both) of the worker's output may suffer and consequently his wage-earning capacity.

Nervousness or timidity in resuming work at which the injury is received is quite understandable. A patient may for this reason have to exert extreme caution at his work, and the amount of work he can turn out in a given time may, therefore, be considerably reduced. The patient may feel so anxious for the safety of his remaining eye that he will prefer to relinquish his former work, and accept safer, but less skilled, and less remunerative work. We must, however, remember that the men who do not wish to work at all, or who wish to magnify their claim for compensation, are in the habit of expressing fear or incapacity for their old work, but they get quite anxious to resume that work when they have received a lump sum in commutation of their claim.

Constitutional Diseases attributable to Injury.

It may be argued, with some show of reason, that an injury by lowering tissue resistance may be the starting point of any disease. In law the causal connection between an injury and a disease must be direct and conclusive before a claim for compensation can be sustained on this ground.

There are some diseases which most surgeons will agree may be set up by minor injuries. Of these specific *parenchymatous keratitis* is an example. Cases of this kind have been recorded by Perlia, Enslin, Valude, Demaria, Dodd, Bronner, Leplat, and others mentioned by Ronnaux³³, who adds two fresh cases, and states that in the discussion on Perlia's case at the Congress of Düsseldorf, Nicden, Scheffels, Limbourgi, Guillery, and Plange admitted the causal connection, and added some personal observations of the same kind. Guillery³⁴ has discussed the question of the traumatic origin of some diathetic ocular affections, and admits that syphilitic and tuberculous lesions may arise from traumatism.

On the other hand, v. Hippel³⁵ in reviewing twelve reported cases, argued that this number was too small to establish any connection between trauma and parenchymatous keratitis, and that it was not certain that the trauma antedated the keratitis in all cases. Since then, however, the evidence in favour of a causal connection has greatly increased.

The rôle of trauma in the causation of *phlyctenular keratitis* is not so well established. Still more startling is a case of *gummatous iritis* due to traumatism, recorded by van der Hoeve.³⁶

Chapelle³⁷ has suggested a causal connection between traumatism and the development of *choroidal tumours*. *Glaucoma* is not an infrequent result of injury, but apart from the secondary variety, it has been pointed out by De Schweinitz³⁸ that glaucoma of the same type as the primary variety may follow trifling injuries of the eyes, e.g., the lodgment of a foreign body in an eye predisposed to glaucoma. Similar results may follow contusion of the eye without any discernible lesion to account for the increased tension, or they may be associated with manifest lesions in the anterior part of the globe or with ophthalmoscopic changes: retinal hæmorrhages, optic neuritis and choroiditis. Peters³⁹ and Villard⁴⁰ report cases of acute glaucoma following contusions of the eye with or without intraocular hæmorrhage or other complications. In practically all the cases recorded the patient was of an age at which glaucoma might be expected to develop spontaneously. It is not unusual for a patient who is suffering from *intraocular hæmorrhage* to find a fitting injury to account for it, and it may be a very difficult matter for the surgeon to disprove the contention.

The same remarks apply to *optic neuritis* and *optic atrophy*. In these cases, however, the injury must needs be pretty severe, and should leave its impress on some part of the cranium or the orbital margins; by close investigation of these points and of the whole nervous system, a definite conclusion as to the origin of the diseased condition should be arrived at.

Myopia, as the result of blows on the eye or falls on the head, has been described by Bourgeois⁴¹ and Frenkel. Frenkel⁴² recognises four types of traumatic myopia.

1. Spasmodic myopia.
2. Myopia due to relaxation of the zonule.
3. Myopia due to subluxation or dislocation of the lens.

4. Myopia due to elongation of the axis of the eye. Bailliart⁴³ records the case of a boy (workman) who contracted *gonerhial opthalmia* through getting some liquid for removing inkstains in his eye. Bailliart regarded the

case as a working accident because there was definite injury, which was followed, after the usual incubation period, by the disease from which the patient had not previously suffered in any shape or form. He adds that Schmeichler and Baudry have recorded similar cases, but the latter disagrees with Bailliart as to the liability of the employer. The reviewer has seen chance of the lid follow a fellow-workman's attempt to remove a foreign body from a friend's eye with his tongue. It can hardly be held that the employer should be held responsible for the result of such a foolhardy procedure.

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Simulation, Exaggeration, Aggravation, Substitution.

All beneficent legal Acts are open to abuse, and the Workmen's Compensation Acts are no exception to the rule. The frequency of simulation increases according as the possibility of extorting money by that means gets better known. Baudry¹¹ gives the following estimates of its frequency by different observers:—

- Schmeichler (Austria) 29 per cent.
- Jacqueau (Lyons) 80 per cent. exaggeration.
45 per cent. pure simulation.
- Willot (Valenciennes) 75 per cent.
- Schmidt-Rimpler (Germany) 80 per cent.-85 per cent.

According to Nieden, however, there is a gradual diminution in the frequency of simulation in Germany. In the opinion of the reviewer it is decidedly on the increase in England. Simulation generally takes the form of pretended complete loss or diminution of vision in one or both eyes. It is comparatively easy, with the numerous objective and subjective tests at our disposal to tell whether an eye is blind or not, but it is not so easy to demonstrate that the simulator is possessed of better visual acuity than he admits. In this matter we have to depend on the exclusion of organic and functional diseases which might reduce vision, and our resourcefulness in exposing discrepancies in his answers. This is not difficult with uneducated workmen, but with the more educated, or, at any rate, the more "knowing," the case is far otherwise.

If the surgeon convinces himself that there is amblyopia he must further decide whether it is of traumatic or non-traumatic origin. In the absence of signs of injury the presence of a central scotoma would suggest toxic amblyopia or amblyopia exanopsia, according as the history pointed to excessive use of tobacco or alcohol or to a squint in childhood.

The exaggeration of genuine or fictitious subjective symptoms is exceptionally frequent among claimants for compensation. Periorbital neuralgia, asthenopia, muscæ volitantes are frequently complained of after all signs of reaction from injury have disappeared from the eye. It is very difficult to

disprove the reality of these symptoms, but if they increase in severity as the eye recovers and as the prospect of litigation increases, we must regard them with grave suspicion.

The deliberate *aggravation* of signs of injury is, in the reviewer's experience, seldom met with in England, but he has seen suspicious hyperæmia of the eyes of some claimants when they appear for an official examination. Any rubbing or irritation of their eyes in these cases would be done more with the intention of displaying the genuineness of the symptoms (photophobia, etc.) rather than with the object of delaying recovery. *Substitution* or the attempt to ascribe the local manifestations of a general disease to accident is getting increasingly frequent. Nowadays the workman will hardly admit that he has any disease which is not directly or indirectly due to injury. Thus, we have seen accidents made accountable for mucopurulent conjunctivitis, phlyctenular and specific keratitis, rheumatic and syphilitic iritis, senile cataract, specific choroiditis, albuminuric and diabetic retinitis, optic neuritis, and atrophy of cerebral or specific origin, and even choroidal tumours. In many instances the claims have been successful until the Insurance Companies have got tired of the cases and have sent the patient to be examined by an ophthalmic surgeon. To what extent injury does excite constitutional diseases of the eye has been already discussed.

Simulation and exaggeration are responsible for a large amount of litigation under the Workmen's Compensation Acts. One of the reasons for these proclivities of the workmen is that they are not satisfied with the compensation allowed by law (half the weekly wage during total temporary incapacity). They consider that something ought to be allowed for actual damage to the eye, loss of time, pain and inconvenience and such other matters which have no relation whatever to the question of earning capacity on which alone their compensation is based. They are often aided or instigated to make these claims by unscrupulous lawyers, whose touts waylay the patient at the hospital gates, or even invade the wards lest the patient should regard himself as cured before he is enlightened as to the money-making possibilities of accidents. The lawyer knows that the patient can only claim a certain weekly payment during incapacity, but he also knows that if the incapacity be kept up long enough he will be able to induce the Insurance Company to commute for a lump sum. Having attained this object, he divides the spoil between himself and the workman, but the division is generally very much to the advantage of the solicitor.

Possibly medical men are the unconscious cause of the prolongation of some of these cases. The workman finds things very comfortable with half his weekly wages and the contributions from one or two clubs. In order to draw the money from the latter he requires club notes, and it is these which are sometimes given without due consideration as to the patient's ability to work. In France^b it is alleged that a special class of practitioner has sprung up in connection with these cases. The workman is allowed to call in any doctor he pleases, and naturally he favours the one who makes the most of the injury, a condition of affairs which has brought a good harvest of well-paid work to the unprincipled.

To avoid litigation many suggestions have been made. Sym's suggestions¹⁶ are :—

1. That there should be drawn up a list of trades classified according to the amount of vision, and more especially of near vision, absolutely required for each.
2. That each skilled workman should have a Health Ticket, showing (besides such matters as, e.g., that he was operated on for appendicitis or has

lost one and a-half fingers of his left hand—the actual state of his vision. Any employer who accepts a worker without this will, of course, expose himself to extra risks.

3. That for the loss of one eye (leg, etc.), such and such a proportion of wages paid as an annuity, or lump sum, should be the acknowledged compensation without the necessity of a legal process.

Morley⁴⁷ suggests that simulators should have exemplary punishment, *e.g.*, prison for perjury, and that solicitors who undertake these cases on speculation should be made liable for the employers' costs if the court considered that the case had been brought into court on insufficient evidence, or the costs of both sides should be secured before the case is allowed to be placed on the lists of the court. (The employers, when they win their case, can get nothing out of the workman by way of costs, and the claimant solicitor's costs are often secured by the men's unions, which do not appear officially in the case and are not liable for the respondent's costs.) He also states that the Insurance Companies will have to raise their premiums or insist upon a stringent medical examination of every employee prior to his engagement. "One railway company already acts on this plan, and the examiner has instructions to reject any man who has any condition which might conceivably bring about complications for which claims could be made, although their maladies be quite trivial and not incompatible with continued health and hard work for many years."

It is evident, as Morley says, that if this stringent medical examination becomes general, the Workmen's Compensation Acts will prove themselves **anything** but a blessing to genuine workers, and will bring many a man who has some trivial lesion or abnormality to a condition of chronic unemployment. He further suggests the legalisation of "contracting out" as a possible way out of this difficulty.

Collie,⁴⁸ on the suggestion of Sir John Gray Hill (a former President of the Law Society), proposed that the last two words of Section 15, which enacts that a County Court Judge may refer a matter to a medical referee on application to the Court "by both parties" be changed to "either party," and that Section 5 of the second schedule, which enacts that a judge may, if he thinks fit, summon a referee to sit with him as an assessor, be altered to read "a judge shall on the demand of either party" do so.

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44. **Baudry.** *Simulation et aggravation volontaires des lésures de l'œil* Liège, 1905.
45. *London Daily Mail*, February 10th, 1906.
46. **Sym.** *Ophthalmic Review*, October, 1906.
47. **Morley.** *Law Times*, January 23rd, 1906.
48. **Collie.** *Law Times*, March 27th, 1906.

Prevention of Industrial Accidents and their Complications.

Much has been written on the surgical treatment of eye injuries. Terson's⁴⁹ paper gives a fair resumé of modern methods. Antisepsis and asepsis have reduced inflammatory, suppurative and sympathetic complications to a very low figure. The number of serious accidents at work have been greatly reduced by enforcement of the Factory Acts, but the Workmen's Compensation Acts have increased the apparent number of accidents immensely. The apparent increase has become particularly noticeable since the Act of 1906, by which the worker is paid compensation from the date of accident under certain conditions. Previously the worker had to forfeit two weeks' wages in any case.

and it was not worth his while to report a minor accident under such conditions. The figures of a large Insurance Company in the Midlands show that the number of reported accidents has almost doubled since the passing of the Act of 1906. The analysis by the same Company of 2,000 consecutive accidents shows that 1576 were off machinery and only 424 on machinery. It is evident, therefore, that the protection of the workman is at the present time more urgently needed than the protection of machinery.

The workmen, however, are not at all disposed to adopt means for the protection of their eyes (gauze or glass protectors, etc.). In fact the reviewer knows a firm which lost a large number of their best workers in their attempt to enforce the rule of wearing protectors, and they were reluctantly compelled to abandon the project.

The statistics further show that the frequency of accidents is largely dependent on the age, and presumably the experience of the workman. The percentage of accidents reported were as follows :—

		Per cent. of Accidents Reported.	Per cent. of Employees in Factory.
Ages between 13 and 20.		32.4	22.25
" " 20 " 30.		30.8	29.23
" " 30 " 40		16.4	22.84
" " 40 " 50		11.4	13.20
" " 50 " 60		6.2	8.91
" " 60 " 70		2.3	2.81

It has been suggested that many accidents are due to fatigue at the end of a long day's work at, or at the end of the week, but the Insurance Company's figures also show that the largest number of accidents occur between breakfast and dinner, and during the first three days of the week.

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49. Terson. — *La Clinique Ophthalmol.*, May 10th, 1908; cf. Review in *THE OPHTHALMOSCOPE*, June, 1908.
50. *The Ophthalmic Year Books*, 1905 to 1908, have been consulted in numerous instances.

BRITISH MEDICAL ASSOCIATION.

OPHTHALMIA NEONATORUM COMMITTEE REPORT.

Readers of *THE OPHTHALMOSCOPE* will remember that some little time ago a committee was appointed by the Council of the British Medical Association to investigate and to report upon the subject of ophthalmia neonatorum. Upon the recommendation of this Committee, the Royal Society of Medicine, the Ophthalmological Society, and the Incorporated Society of Medical Officers of Health were invited to appoint additional members. The co-operation of the Central Midwives Board was also invited. The Committee, thus constituted, consisted of the following gentlemen :— Sydney Stephenson (Chairman), R. C. Buist, Simeon Snell, J. A. Macdonald, Edmund Owen, Edwin Rayner, C. J. Martin, Cecil E. Shaw, T. Arthur Helm, Henry Russell Andrews (representing the Obstetrical and Gynaecological Section of the Royal Society of Medicine), George Carpenter (representing the Diseases of Children Section of the Royal Society of

Medicine, Arnold Lawson (representing the Ophthalmological Society), and Edward Sergeant (representing the Incorporated Society of Medical Officers of Health).

The following are the conclusions and recommendations of the Committee :

Conclusions and Recommendations.

I. *Prevalence.*

(Pars. 2-28.)

1. Ophthalmia Neonatorum accounts for upwards of 10 per cent. of all cases of blindness.

2. Cases of ophthalmia show a slight but steady decrease so far as can be judged by returns from British Lying-in Hospitals and Departments, and Eye Hospitals.

3. Ophthalmia Neonatorum is still (as it has been for many years) the cause of at least one-third of the blindness in inmates of British Blind Schools.

4. Cases of ophthalmia without adequate treatment have been found to occur amongst cases attended by medical practitioners, as well as amongst those attended by midwives.

II. *Prevention.*

(Pars. 29-88.)

A.—*Administrative and Educative Measures.*

(a) *Notification.*—It is advisable to urge upon the Local Government Board that notification of Ophthalmia Neonatorum should be compulsory.

(b) *Inspection and Treatment.*—It should be the duty of the Local Sanitary Authority, upon receipt of notification, to enquire as to the facilities for treatment, and, if these be deficient, to arrange for the efficient treatment of the disease. The treatment of infantile Ophthalmia should not involve separation of mother from child if this can be avoided.

(c) *Bacteriological Examinations.*—It is suggested that the bacterioscopic examination of vaginal or conjunctival discharges should be undertaken, free of charge, by the Local Sanitary Authority, when such a request is made by a qualified medical practitioner.

(d) *Educative Measures.* Notices regarding the dangers of Ophthalmia Neonatorum should be issued by Local Sanitary Authorities. They should also be exhibited in Post Offices and other public places. Such notices should be periodically distributed by the Local Supervising Authority to every midwife whose name appears on the roll of midwives for the particular area concerned.

(e) *Central Midwives Board.*—The presence of purulent vaginal discharges should be included by the Rules of the Midwives Board among the conditions for which medical help should be summoned.

(f) *Maternity Hospitals.* It is recommended that among the members of the medical staff every Maternity Hospital should include an ophthalmic surgeon. The maintenance of accurate records concerning Ophthalmia Neonatorum is suggested as a means of keeping the disease constantly under the notice of all concerned.

B.—*Medical Measures.*

DIRECTIONS TO MIDWIVES AND NURSES.

I.—*Treatment of cases presumably normal as regards danger of Ophthalmia Neonatorum.*

Child.—In every case in which a medical practitioner is not in attendance the midwife or nurse should adopt the following routine procedure :—

- (i) Directly the head is born, and before the eyes are opened the lids and the surrounding skin should be wiped clean on each side with a separate piece of sterilized wool.
- (ii) Nothing should be dropped into the baby's eyes.
- (iii) The face and the body should not be washed in the same water. Fresh water should be taken for each.

II.—*Treatment of Cases in which the Mother suffers from a purulent vaginal discharge.*

(a) *Mother.*—If there is a purulent vaginal discharge, whether in pregnancy or labour, medical help must be obtained.

(b) *Child.*—If a doctor is not already present when the child is born, he should be sent for immediately, in order that any necessary application to the child's eyes may be made.

III.—*Procedure where an affection of the child's eyes is observed.*

If there is any inflammation of the baby's eyes, however slight, shown by redness, swelling, or discharge, the midwife or nurse must explain that the case is one in which the attendance of a registered medical practitioner is required, and medical aid must be obtained in accordance with the Rules of the Central Midwives Board.

SUGGESTIONS TO MEDICAL PRACTITIONERS.

In view of the conflicting opinions regarding the precautions that should be observed by practitioners for the prevention of ophthalmia neonatorum, the adoption is advised of the following simple measures, which, it is believed, are in accordance with our most recent knowledge and experience :—

A.—*Presumably non-infected Confinements.*

(a) *Mother.*—A policy of non-interference.

(b) *Child.*—The practitioner should make it his business to see that as soon as possible after the head is born, and before the eyes are opened, the eyelids are cleansed with sterilized wool, and that separate water is used to wash the baby's face and body.

B.—*Confinements where infection is known or suspected to exist.*

(a) *Mother.*—Steps should be taken to examine bacteriologically any morbid discharge from the genito-urinary passages, and appropriate treatment should be adopted for the underlying conditions.

(b) *Child.*—The baby's eyelids should be carefully wiped free from secretion with sterilized wool, and a single drop of a one per cent. solution of silver nitrate should be placed in each of the baby's eyes. The two per cent. solution of silver nitrate, originally recommended by Professor Credé, although most efficient in preventing ophthalmia, has been shown to be of a more irritating nature than the liquid now recommended for use. There is some

evidence to prove that silver vitelline—known commercially as "Argyrol,"¹ used as a twenty-five per cent. solution, is a non-irritating and efficient preventive of ophthalmia. But so far it has not been employed on a sufficiently extensive scale to justify a more dogmatic statement with regard to its value.

The foregoing suggestions deal only with the *prevention* of ophthalmia neonatorum. When once the disease has broken out, it is impossible to exaggerate the importance of prompt and efficient curative treatment.

TRANSLATION.

ON TUBERCULINS T.R., B.E., T.B.K.

Their powerful curative effect on Ocular Tubercloses, Tuberculides, and Tubercules.*

BY

DR. LOUIS DOR,

LYONS, FRANCE.

The medical mind of the French is like a bowl of punch; it takes fire easily, but once burnt cannot be relighted.

If ever there was a medical riot it is the one that raged in 1891, after the invasion of our country by Koch's lymph. What a time it was! I was present at the meeting of the Berlin Congress when Koch launched—as a bolt from the blue—his discovery of the curability of tuberculosis. The meeting went mad, and had to break up. We all retired to the lobbies to discuss the communication; in a corner I translated it to a group of French surgeons who had not understood it. It was decided to go next day to the laboratory to see the mysterious remedy. But next day we were refused admittance. Koch had disappeared from Berlin, and withdrawn from the possibility of being interviewed. No one knew what to think about it all. Nevertheless, the discoverer of the bacillus had a great reputation, and although it was contrary to custom to employ a secret remedy, we got away with the little glass-stoppered phials (at a price—containing a brown, syrupy fluid, with the aid of which we were to dissolve giant cells, to scatter epithelioid cells, to fatten the phthisical, to fill up lung cavities, and, in a word, to crush the bacillus).

Since the result was the exact opposite of what had been expected, and hundreds of victims paid the price of the experiment with their lives, the disillusionment was great; and now, after eighteen years have elapsed, the impression which it made remains uneffaced.

By almost the whole medical faculty in France tuberculin is considered as a dangerous remedy, which, at the most, may serve for the diagnosis of latent tuberculosis. And even from this standpoint the use of tuberculin has its detractors, among whom I once counted myself. Let me quote the third conclusion of Aubineau's work¹ on the tuberculin ophthalmia-reaction: "The method should be absolutely given up in cases where the eyes present either distinct signs of tuberculosis or of such affections as ulcerative vascular

*Des Tuberculines T.R., B.E., T.B.K., leur action curative puissante sur les tuberculoses, tuberculides et les tubercules oculaires. *La Clinique Ophthalmologique*, 10, avril et mai, 1909, pp. 100-103.

keratitis and phlyctenular disease in children, which are more or less directly related to tuberculosis." Thus, even in instillation once or twice for diagnostic purposes, tuberculin would seem to be harmful in tuberculous eye affections, and it is this same tuberculin which is to have the power of curing ocular tuberculosis! What an odd contradiction in terms! and where are we to find the truth?

We shall try and solve the riddle, but my readers will at once understand the conclusion to which I would draw them if they will consider the following parallel fact:—pulmonary tuberculosis is cured by continuous aeration, yet a strong current of air would cause congestive attacks in these very patients and would aggravate the disease.

The history of tuberculin therapy applied to ocular tuberculosis commenced with the discovery of Koch's lymph. From the month of September, 1890, and during the whole of 1891, simultaneous attempts were being made. Koenigshoefer⁽²⁾, Wagner⁽³⁾, Landgraf⁽⁴⁾, Leber⁽⁵⁾, and Haase published the first results, and they were of an encouraging kind.

If, even in 1892 there commenced a silence, it was not because there had been unfortunate cases, but because aggravation of cases of pulmonary tuberculosis began to be recorded here and there, and the oculists took fright. Then, on the other hand, experiments on rabbits did not give the wished-for results, and Baumgarten⁽⁶⁾ in Germany, and Gasparini⁽⁷⁾ in Italy had therapeutic failures in eye-inoculated rabbits.

Confidence in the lymph was thoroughly shaken when Koch gave out that his liquid was a tuberculous toxin derived from cultures, and that the lymph was called tuberculin. When, in 1897, Koch announced that he had divided his old tuberculin into two products, one of which, T.O., contained toxic bodies, and the other, T.R., contained only curative bodies, his statement met with incredulity among oculists and physicians. Zimmermann⁽⁸⁾ alone took the risk of treating a patient whose right eye he had enucleated for a tuberculous lesion, and who had a lesion of the same nature in the left eye. He was fortunate enough to obtain a complete cure, but he was not listened to by the oculists. His communication met with no response, and who can tell how many of his brethren considered the cure under tuberculin a mere coincidence?

However that may be, it was not until 1900 that another bell clanged the same note. von Hippel, at Halle, cured five patients with tuberculin T.R. von Hippel unfortunately handed over to his pupil, Schieck, the announcement of these five cases and Schieck⁽⁹⁾ desired to support the observations of his chief by laboratory experiments. He produced experimental tuberculosis of the eyes in rabbits, and sought to cure these lesions by tuberculin T.R. He obtained no definite result, so that the laboratory experiments, instead of supporting the clinical observations, rather opposed them, and the reader was left doubtful. A certain amount of scepticism persisted. A few authors took the risk of the treatment here and there of isolated cases, and of giving a favourable report. Thus, we have the observations of Morax and Chaillous⁽¹⁰⁾, Falkenberg⁽¹¹⁾, Haab and Pfleger⁽¹²⁾, Handmann⁽¹³⁾, and of Enslin⁽¹⁴⁾, in which the authors sometimes caused strong reaction with strong doses at long intervals, and sometimes gave daily weak injections without altering the dose. There was still no proper regulation of *technique*. One always felt inclined to ask if there were no unpublished unfavourable cases.

During this time von Hippel continued to treat his tuberculous cases by injection of tuberculin T.R., and he brought order into his principles of treatment by following a new method. From Hippel's work⁽¹⁾ really dates tuberculin therapy as applied to ocular tuberculosis. von Hippel published twelve cases of cure, and in 1905 at the Heidelberg Society⁽¹⁶⁾ he added fourteen

more new observations. These last are summarised in Darier's work (19), von Hippel regards tuberculin, not as a curative serum, not as a specific anti-body, but as a poison to which the organism must become accustomed by progressively increasing injections. He performed on his first patients injections which were much more slowly progressive than those of his assistant Schieck in treating rabbits, and he cured his patients, although Schieck failed to cure his rabbits. Slow progress, then, is what is required, so slow indeed, that all local reaction and elevation of temperature are absent. That is the secret of the method and von Hippel advises us to proceed as follows:—

Commence with injections of $\frac{1}{500}$ th of a milligramme of active substance and take the temperature carefully. If the temperature rises to about 38°C , diminish the dose, if not, increase it progressively from $\frac{1}{500}$ to $\frac{2}{500}$, $\frac{3}{500}$ etc., up to $\frac{10}{500}$ or $\frac{1}{50}$. When the dose of $\frac{1}{50}$ th milligramme has been reached, inject $\frac{3}{50}$, then $\frac{4}{50}$, $\frac{1}{50}$, and $\frac{10}{50}$. Finally, one-fifth milligramme and one milligramme are reached. The treatment must be long. In certain cases five or six months are required for a definite cure. I am not going to detail the method any further, for I am at present dealing only with the historical aspect. The only thing that is to be remembered is that since 1904 von Hippel has shown oculists how tuberculin could be employed, and that dating from Hippel's work tuberculinotherapy has no longer consisted in the provocation of a local reaction accompanied by a rise of temperature, but, on the contrary, in the injection of extremely weak doses which cause no reaction, and increasing these doses in such a slowly progressive fashion that the temperature never rises above 38°C .

von Hippel's work has been a revelation to ophthalmologists, and we may look upon it as an honour that an ophthalmologist has established the *technique* of a treatment which is applicable to all the other branches of medicine.

From 1905, on all sides, interesting work began to come forward, and tuberculin therapy rapidly regained the ground lost since 1891. Fleischer (18), Gilbert (19), Lundsgaard (20) first attacked tuberculosis of the conjunctiva; very soon Gamble (21), who gives a complete account of the matter, treated tuberculous iritis with success; then, in the year 1906 alone, we find the works of Axenfeld (22), Reuchlin (23), Wolfrum (24), Brückner (25) in Germany; Darier (26) and Kohmer (27) in France; Förök (28) in Hungary; Diem (29) in Switzerland; Koster (30) in Holland; Wilder (31) in America; Capolongo (32) in Italy.

The method had now really come into use. Reuchlin speaks of 30 cases treated and cured at the Tübingen clinique. Axenfeld treated not only cases of iritis with nodules, but also serous iritis, chronic irido-cyclitis, and disseminated choroiditis the tuberculous nature of which he established by curing them with tuberculin.

Diem saw 32 cases treated at the Zurich clinique. He is less enthusiastic than the others. Not in all, only in the majority of cases was the treatment efficacious. But it is only right to say that, contrary to other authors, Diem used old tuberculin, and not tuberculin T.R., and perhaps that is the reason of his less constant success.

Darier points out that in cases where the local reaction has been a little too strong, it can be throttled by the subconjunctival injection of guanacol, an important fact to know, because since 1904 it has been understood that local reaction ought to be avoided.

In 1907 a series of important papers appeared. First of all the thesis of Krstitch (33), inspired by Prof. Kohmer; then followed articles by Förök (34), Bull (35), Erdmann (36), Herford (37), Snell (38) and Hancock and Mayou (39).

The two last are particularly interesting because the authors followed, during

the treatment, the variations of the opsonic index, and observed that when the reaction was a little too strong the index became sensibly reduced, while, on the other hand, under the influence of treatment when reaction was avoided, the opsonic index rose. This finding is a true demonstration of the correctness of Hippel's idea. We must notice also the important paper by Stock⁽⁴⁰⁾ in which Axenfeld's pupil puts forward ideas which are identical with those of Poncet on inflammatory tuberculosis, and shows the result of treatment of this kind of eye affection. Stock believes in tuberculin T.R.

The idea of carrying out a complete course of treatment without having the least reaction is very generally accepted, but one may rely on the advice of von Hippel that we should not cause an increase of temperature of more than half a degree.* While ophthalmologists are in agreement as to the proper *technique* to adopt, physicians on their part have tried tuberculin therapy as applied to pulmonary tuberculosis. Sahli⁽⁴¹⁾ of Berne goes much farther than v. Hippel. He asked a bacteriologist of Neuchâtel to make for him some solutions of tuberculin much weaker even than those of German authors and, intends to avoid any elevation of temperature, even of only half a degree. Instead of having five solutions of decreasing strength he has fifteen of them, and the weakest is so weak as to be homœopathic. One drop is injected of a $\frac{1}{1000000}$ solution, which is equivalent to putting a drop of tuberculin in 51 litres 200 cc. of water, and injecting one drop of the mixture.

With the year 1908 appeared articles by Alessandro⁽⁴²⁾, by Kramer⁽⁴³⁾, and the important work of Rohmer⁽⁴⁴⁾, known to all readers of this journal. I may be permitted, nevertheless, to quote the following passages from Rohmer:—"In no single case where tuberculin has been employed for ocular tuberculosis has generalization of the morbid process been observed" (p. 354). "With, on an average, twelve injections, and after two or three weeks of treatment by tuberculin I have seen, in my patients, inflammatory ocular phenomena begin to abate, and deep-seated corneal opacities begin to clear up; large nodules of the iris appeared smaller and less vascularized, while several miliary nodules were no longer visible" (p. 355, 356). "When mercury and iodide have been used with earnestness for one and two years without producing any favourable result, and have been replaced by tuberculin with rapid and obvious success, there is no possibility of doubt as to the indications" (p. 335.) Rohmer's eight detailed cases will be read with very great interest by those who have not yet perused them.

If one were to read all that has been written since 1906 the cause of tuberculin T.R. would appear to be completely established; but the question is slightly complicated in the following respect. von Hippel is abandoning tuberculin T.R. for tuberculin B.E., and is setting up at present alongside of tuberculin-therapy T.R., a tuberculin therapy B.E. Then there is the treatment by Béraneck's tuberculin, T.B.K., about which amongst others we shall speak presently. Why is a remedy which has given such good results to be given up so soon? Have there been disappointments? That is what Hippel's assistant, Davids⁽⁴⁵⁾, has given us to understand. But, after all, there has been nothing serious. No patient has been made worse, and there have not been any of the complications which followed the use of the first tuberculin in 1891. But there have been some relapses rather too soon after a cure which had been thought definite, and it certainly seems necessary to go on investigating, and not to stick too closely to the track of 1904.

It was Koch himself, consulted by von Hippel, who advised the latter to try tuberculin B.E. (Bacillary Emulsion), which has been purchasable since

*It must be noted that this refers to the Centigrade scale. E.T.

1901. As a matter of fact, von Hippel, ever since 1900, has used this new preparation and, in November, 1908, he published, through his assistant, Davids, the result of the treatment of ten patients, with detailed notes. I will give a brief *résumé* of these.

In the first case there was typical tuberculous iritis. Forty injections gave a complete cure. In the second case, of tuberculous iritis, with affection of the vitreous and cornea, the patient counted fingers at 3 metres. Fifty injections caused disappearance of the lesions, but left slight opacity of the media. The V.A. came up to 1 to. The third case is that of a child of 14 years, with tuberculous iritis and corneal infiltration. Cure after 42 injections. In the fourth case there was chronic iritis, with synechiae and exudate in the pupil. In four months it all disappeared and the V.A. rose from 0.01 to 0.8. The fifth case had nodules of episcleritis with corneal infiltrates. Sixty injections, increased progressively from $\frac{1}{10000}$ milligramme to 1 milligramme, were well borne. The episcleritis and corneal infiltrations all disappeared. The sixth, seventh, and eighth cases are parenchymatous keratitis, and the ninth and tenth are cases of tuberculosis of the conjunctiva. The former were quickly cured, the latter were a little more troublesome. The ninth case, in particular, required six months, and 70 injections, before it was cured.

Thus the new tuberculin B.E. has been shown to be still more active than tuberculin T.R. The patients have been more quickly cured, and it has been possible with it to cure tuberculosis of the conjunctiva, which had been rebellious to tuberculin T.R. Davids adds that tuberculin B.E. is less liable to be followed by relapses, but it seems to me somewhat premature to come to such a conclusion, seeing that the method only dates from 1906. It is only after several years that useful comparisons can be made.

We may remember two important points:—1) tuberculin T.R. and tuberculin B.E. have each to be credited with many cases of cure. 2) At the Göttingen clinique, where therapeutic injections especially have been performed, tuberculin B.E. is at present preferred to tuberculin T.R.

Here ends my historical study. I ought, however, to chronicle the attempt by Collin⁽⁹⁶⁾ to treat ocular tuberculosis by Behring's tulase and antitulase. The author seems satisfied with his results, but does not publish details.

At this point I would like to come personally into the discussion.

ERNEST THOMSON

Trans.

(To be concluded.)

CURRENT LITERATURE.

NOTE. Communications of which the titles only are given either contain nothing new or else do not lend themselves to abstract.

I.—LEPRA NODOSA OF THE EYE.

Calderaro. Clinical, anatomical, and experimental researches on lepra nodosa of the eye and its adnexa. *Ricerche cliniche, anatomiche, e sperimentale sulla lepra nodosa del globo oculare ed assesi.* *La Clinica Oculistica*, Jan.-Feb., 1900.

In this long and interesting paper Calderaro gives much important matter concerning a disease which is almost unknown in London clinics. The

study of leprosy, as it affects the eyes, has been undertaken, he says, only within the last generation, although the disease is one of the few that have been recognised from the earliest periods. Ocular leprosy is usually a late manifestation of the disease; it appears sometimes as a late invasion, in the nodular form, after the face, especially the eyebrow and the lid margin, has been riddled with patches of the disease; sometimes, on the other hand, the ocular changes are secondary to the corneal anaesthesia, and the lagophthalmos, brought about by the contraction of the lids and the paralysis of the sphincter, is not truly leprosy in character. It is very rare that the eye is the seat of the primary manifestation. Calderaro has been able to find only three such cases.

In the paper under review Calderaro deals exclusively with the nodular form of the disease, since he has not had sufficient material of the other form to base conclusions on. Of the nodular form he has examined ten cases, in which both eyes were affected. In one case an autopsy was made; in two others the eye was enucleated; and in others the lepromata were removed from the corneoscleral limbus. In all, many bacterial examinations were made of the skin of the lids, of the lid-margin, of the conjunctiva, the limbus, the tears, the lacrymal passages, the nasal mucous membrane, and the aqueous humour.

The results were as follows.—The skin of the dorsum of the lid rarely showed the specific bacillus, although it was freely studded in many cases with lepromata. On the lid margins, however, the bacilli were very numerous, even when the lid appeared absolutely normal. In the tears, and in the tear passages, no bacilli were found. In the conjunctival sac, and in the deeper layers of the mucous membrane, the bacilli were almost constant, when the lid-margin was affected with leprosy. On the limbus, bacilli were usually found in quantity, and even when the limbus appeared quite normal, they were still present, although few in number. The aqueous was usually free from bacilli, even when both limbus and cornea were affected; in fourteen eyes bacilli were found on two occasions only, scattered in hyaline cellular *débris*.

The bacilli were found in enormous quantities in the nasal and palatine mucous membranes, and in less amount on the handkerchiefs used by the patients and on their fingers.

The chief question in which Calderaro is interested is the manner in which the bacilli invade the eye. There are two ideas current concerning this: one considers the infection of the eye to spread from within outwards; the other thinks the primary lesion always to be superficial and the involvement of the deep parts to be secondary. For the treatment of the local condition it is all-important to decide which of these absolutely contradictory ideas is the correct one.

Calderaro's experiments on animals may be dismissed in few words, since they were uniformly negative. He found, it is true, bacilli in the aqueous humour after the inoculations of some animals, but this is not important. He points out that if grafts containing bacilli killed by prolonged immersion in alcohol are inserted in the anterior chamber, the dead bacilli may be found there for a long period.

Calderaro's anatomical notes are more interesting. He was able to submit to microscopical examination the lids of one patient who showed no signs of lepra in one eyelid, the right, but an advanced condition in the left lids. Clinically, the right lids appeared healthy. The examination showed a number of heaps of cells midway between the orbicularis and the epidermis, forming a sort of chain from the supraciliary region to the lid-margin. These heaps had, for the most part, their long axis parallel to the surface, and, when

cut so as to present a circular section, showed in their centre a hair. With great enlargement, the nodules were found to be made up of small cells, of about the same size having little protoplasm and large nuclei. The starting-point of the leprous infiltration is the hairbulbs, the bodies of the small sweat-glands, the small vessels above the size of capillaries, and the small nerve trunks. There are in this early stage no large cellular forms, and no globes of Kluge; the phase is that of chemotaxis exercised by the bacilli, which throng all these points of commencing infiltration. As the process goes on, the hair follicles are destroyed, and the hairs are not re-formed.

The sclero-corneal limbus is always attacked when the lids have been invaded for some time; this examination is particularly interesting, because many observers have held that the iris is attacked first and the cornea secondarily to it; Calderaro's observation seems to prove conclusively that the cornea is always invaded, and, indeed, often destroyed, before the iris shows any sign of invasion.

In none of the cases did the fundus show any change. Calderaro concludes that the changes described by Trantas are not in any way characteristic of the disease, but are probably accidental and concurrent.

The histological changes which are seen in the eyes in all these stages of the disease are as follows: in the stage of hyperæmia of the limbus, the epithelium appears markedly thickened and presents on its surface scales partially detached, but provided with well-marked nuclei. The middle layers show distinctly the tooth-like processes, and between the cells scattered and shrunken leucocytes, with two or more fragments of nucleus, deeply stained with hematoxylin; the germinal layers very rarely show karyokinesis.

In a well-marked zone outside the sclero-corneal junction, one sees sections of a large number of vessels crowded with red corpuscles and numerous polynuclear lymphocytes, for the most part arranged near the endothelium; in the adventitia there are a few lymphoid elements and plasma cells. The connective tissue appears much infiltrated with albuminous granules, and there stand out the sections of enlarged lymph vessels, which, however, show healthy endothelium, with no trace of investing infiltration. The vessels are arranged in two layers; the one close to the germinal layer of the epidermis, and the other close to the sclera; these can be followed to the level of the ora serrata. The two vascular layers converge and unite at the sclero-corneal junction, and in the angle where they converge there is an infiltration of lymphocytes.

Although the excessive vascular engorgement can be traced into the small branches which are passing from the limbus to the ciliary body, they appear empty after perforating the sclera, and the proper vessels of the ciliary body and the iris show no sign of hyperæmia nor any small-celled infiltration of the adventitia. The characteristic mark of this stage, then, is the great hyperæmia and infiltration of the conjunctival and episcleral tissues of the limbus, and to this is due the gelatinous aspect of the patches. Bacilli are, for the most part, wanting in the deeper layers of the epithelium, and are scarce in the superficial scales. Calderaro never found them in the iris and ciliary body.

The cellular elements increase rapidly in number, and form a dense sheath, which accompanies the vessels without interruption in the sclero-corneal region: but, whereas the subepithelial sheath is composed of a loose layer of three or four cells, the sheath of the episcleral vessels is much thicker, until, finally, the mass invades the lumen of the vessels and substitutes itself for the proper tissue of the walls. At the same time the bacilli became more numerous, and are seen grouped into small globose masses, globes of Kluge.

At this time the microscopical appearances are characteristic, even without the discovery of the specific bacillus. The elements of varying size are grouped into chains, and between them are found the cells rich in protoplasm, and containing the characteristic vacuoles of Neisser in large numbers. The infiltration stops for a time at the margin of the cornea, although it progresses steadily into the sclera; the greatest thickness is almost always found opposite the canal of Schlemm. Later, the disease attacks the cornea also, and substitutes its own tissue for the normal. This process begins as an ordinary vascular pannus, attacking the superficial layers of the cornea, and, as in true pannus, the disease is preceded by the formation of small capillary vessels in the part of the cornea immediately in advance of the spreading edge. These vessels are gradually converted into leprous tissue, and the lamellae of the cornea are first separated and then replaced thereby. The cement substance between the lamellae is first dissolved in the neighbourhood of the leproma and the lamellae are disjoined; in the interstices can be seen ordinary corneal corpuscles. Then, the lamellae break into fibrils, as when the cornea is treated with caustic potash, and the corpuscles show swollen oval nuclei; alongside of them appear small round cells, although whether derived from the division of fixed transformed corpuscles or from lymphocytes cannot be decided. Then, the corneal fibrils are lost, and replaced by very delicate, short, and felted fibrils, which form the sustaining network for the leprous elements. Bacilli are numerous in the invading tissue, and may sometimes be seen slightly in advance of it, in the normal corneal fibrils; it is easier to recognize them in the elements which accompany the vessels of the pannus. Around these vessels we find, occasionally, small nodules of infiltration which, when immediately under the epithelium, constitute the so-called keratitis punctata leprosa. Calderaro does not regard the keratitis punctata, described by some authors as characteristic of leprosy, as anything but the early stage of the invasion by the disease.

There is, however, another form of superficial keratitis seen in some cases, which gives rise to the appearance of a diffuse opacity, made up of a large number of small points: these are tiny bullae, containing a dirty-yellow fluid, in the superficial layers of the much thickened epithelium: the removal of the surface layers seems impeded.

The firm sclerotic tissue protects the inner membranes of the eye against the invasion of leprosy for many years; even when there is extensive disease of the limbus, there remains a layer of the sclerotic, which intervenes between the disease and the deep membranes. The interior of the globe is reached by tracking along the blood vessels, and thus the uveal tract is invaded before the whole thickness of the outer coat is penetrated. The vessels which connect the canal of Schlemm and the episcleral rete are the chief paths; more rarely the vorticosae veins are the carriers.

The ciliary body resists the action of the bacilli: even when the cornea and the adjacent sclera have been covered by lepromata and their structure has become unrecognisable, the ciliary body will show only a few circumscribed foci of infiltration, and even in the latter stage its histological structure is never wholly lost. None of the eyes examined showed any affection of the ciliary body, unless there was considerable invasion of the episclera; the preparations have shown the direct continuity of the process, spreading from the surface upwards. In young subjects, in whom the tissue of the ciliary body is laxer than in age, the infiltration, when it occurs, is more extensive than in the old. The fibres of the muscle of accommodation are, in the early stages, separated by small and large cells; these, as they increase in number, gradually obscure the regularity of structure and the form of the ciliary body. In the last stage the ciliary body is thicker than normal.

The iris preserves its usual thickness, but the cells are increased, and on its surface there appear accumulations of small cells. The pigment layer tends to become detached. When the ciliary body is completely invaded, the iris is found atrophic in all its layers.

The infiltration spreads little beyond the ciliary processes; at the equator the choroid appears normal in the eye, even when the ciliary body has been destroyed; nor is the retina or the optic nerve affected. Bacterioscopic examination of the posterior half of the eye has never shown the presence of the bacteria.

These facts seem to settle once for all the path of the invasion, in favour of the attack from outside. It follows, then, that we must try to prevent the entrance of bacilli in this part by constant cleansing of the surface with dilute alkaline solutions. Patients must be warned not to touch their eyes with their fingers or handkerchiefs, which have been shown to be frequently infected.

Any means, also, which tend to make the episcleral tissue more compact, and therefore less open to the invasion of the bacilli, will commend itself to the surgeon. Peritomy, as already used to prevent the spread of pannus, holds out a hope of effecting a similar protection here; but the operation must be performed with great freedom.

HAROLD GRIMSDALE.

II.—NON-PIGMENTED NÆVUS OF THE CONJUNCTIVA.

Rönne, H.—Nævus conjunctivæ non-pigmentosus. *Klin. Monatsbl. für Augenheilkunde*, April, 1909.

The literature, comprising about fifteen cases, of non-pigmented nævus of the conjunctiva has been given by Saemisch in the *Graefe-Saemisch Handbuch der gesamten Augenheilkunde* as recently as 1904. Rönne (Copenhagen) states that one case only has been added since then, namely, by Oatmann in the *Archiv. für Augenheilkunde*, l. III.



Rönne now reports two additional cases, brief details of which follow:—

Case No. 1. Female, aged 21 years. A small brownish-yellow spot was observed on the upper conjunctiva of the left eye fourteen days after birth. It remained without alteration for many years, but it commenced to get larger some six months before Rönne saw the patient, and had become associated with epiphora and pain in the eye. Its appearance and dimensions are shown in the Figure.

A portion was removed for purposes of diagnosis, and, with a view to preventing further extension, Paquelin's cautery was applied to the conjunctiva bounding the neoplasm. No renewed growth had taken place during the fifteen months the patient remained under observation. The microscopical appearances of the excised fragment agreed closely with the description as given in the Graefe *Saemisch Handbuch*. The growth contained (1) epithelial, and (2) nevus cells. Larger or smaller epithelial cysts were present. There were no signs of malignant proliferation of the epithelium. Pigment was practically absent. Goblet and mast cells were present.

CASE No. 2. A smooth, reddish thickening, quite like the growth described above, was present on the ocular conjunctiva of one eye in a female, whose age is not stated. It had been noticed for at least eight years. It was non-progressive, and caused no distress. A piece of the growth was excised, and when examined with a microscope, was found to present appearances identical with those of the first case. The cysts, however, were somewhat smaller.

SYDNEY STEPHENSON.

III—FOLLICULITIS CILIARIS NECROTISANS INFECTIOSA.

Pascheff, C.—Upon a new disease of the edges of the eyelids. [*Sur une nouvelle maladie des bords ciliaires (Folliculitis ciliaris necrotisans infectiosa et un bacille particulier isolé dans cette maladie.*] *XI Congresso Internazionale di Oftalmologia*, 1909, fascicolo secondo, p. 518.

During the last two years **Pascheff**, of Sofia, has met with three examples of a peculiar disease of the edge of the eyelids. He believes that the malady has not been described, and he purposes to term it "Folliculitis ciliaris necrotisans infectiosa."

1. Symptoms.—The affection always begins with general symptoms, such as anorexia, weakness, and fever, and to these are speedily added swelling and tenderness of the preauricular and submaxillary glands of the side corresponding to the affected eye. Soon after the appearance of the symptoms enumerated above, the patient experiences an itching at the inner angle of the eyelids, where, before long, a pustule appears. The pustule, which may vary in size from a peppercorn to a lentil, is of yellowish-white colour, prominent, and situated upon an indurated and inflamed base. It spreads along the edge of the lid, and may involve the other eyelid. It may eventually attack the skin of the eyelids, or be accompanied by ulceration of the conjunctiva, ocular or tarsal. The eyelid itself is swollen. After elimination of necrotic tissue, the parts slowly cicatrise, during which symblepharon may form.

2. Prognosis.—Taken in time and treated properly, the prognosis of the disease is good. Cilia may, of course, be lost, but the indurated points left on the edges of the eyelids disappear with lapse of time.

3. Ætiology. The cause of the affection is at present obscure. In the three cases reported by **Pascheff**, streptococci were found in the first, *s.p. aureus* in the second, and a peculiar bacillus in the third. The bacillus in question was isolated from the affected cilia; was found in sections of the diseased parts; and, finally, was of an extremely virulent nature, as tested by the inoculation of guinea pigs and white mice. These points make the author inclined to regard it as the essential cause of the disease. Some details of the organism were: a short bacillus, with rounded ends, which grew upon all media at room temperature.⁴ It was immobile, non-sporing, non-capsulated, Gram-negative, and did not liquify gelatine or blood-serum. After twenty-four hours it rendered bouillon cloudy. It did not produce indol after five

⁴The exact words used by **Pascheff** are: "*pousse sur tous les milieux à la température du laboratoire*." This may mean not room temperature (20 to 22 °C.), as rendered above, but incubation temperature (37.5 °C.) = 85°.

days, but grew in peptonized water. It grew either in the presence or absence of oxygen. It acidified but did not coagulate milk. It yielded an acid reaction upon Dragalsky, and produced gas in sugar-agar. The micro-organism was examined by Axenfeld, Morax, and Calmette. Axenfeld thought that it was a bacillus not yet found in the eye, but Calmette regarded it the pneumobacillus of Friedländer.

Pascheff characterises the disease as bacterial, and possessed of highly infective and contagious qualities. The point should, perhaps, be mentioned that two of his patients came from the same town. It attacks both old and young. The author's three cases were all in females, aged respectively 28, 14, and 55 years.

4. Pathological anatomy.—The histological changes found by Pascheff indicate that the pustule results not from a suppurative but from a necrotic process in the epidermis. The latter is cast off *en masse* as a thickish membrane, leaving the dermis beneath ulcerated and indurated. The induration may persist for several weeks.

5. Treatment.—Treatment should be energetic. The best plan is to destroy the pustule with the galvano-cautery, and then to keep the parts covered with sublimate compresses. If treated with sublimate alone, the pustule takes a considerable time to heal.

SYDNEY STEPHENSON.

IV. - A SIMPLE METHOD OF TRANSILLUMINATION.

Trantas, E.—On the Examination of the Translucency of the coats of the eye with the aid of a simple lens. (*Exploration de la translucidité des parois opaques de l'œil avec une simple loupe.*) *XI Congresso Internazionale di Oftalmologia*, Fascicolo primo, April, 1909, pp. 44-51.

Trantas (Constantinople) finds that with the aid of a simple lens and a pretty strong light, very useful information may be obtained with regard to the existence, position, and nature of tumours of the eye, where transillumination is not available, or not possible, or where it is uncertain in its meaning. He uses a lens of $+20D.$ or $+30D.$, with which he focusses the light upon the pupil, in such a way that the rays pass obliquely through the pupil to the opposite side of the eye. Under normal conditions the sclera, etc., is translucent and the light shines through it. The presence of an opaque lens does not seem to make any difference in the illumination, so that Trantas' mode of examination is still available where transillumination fails. Dilatation of the pupil renders his method still easier. Two or three cases are cited to illustrate the value of examining the eye in this way.—The first was a case of detached retina situated downwards and outwards. When examined with the lens, the sclera was found to be translucent everywhere, except on the outer side, where it remained quite dark. A diagnosis of melanotic sarcoma was made, which, on removal of the eye, was found to be correct. In another instance a child, suffering from tuberculous peritonitis, had a diffuse, semi-solid thickening of the sclera on the outer side of the left eye. In the absence of any evidence of glioma, and from the circumstance that this portion of the sclera remained quite translucent, the swelling was assumed to be benign. It was incised and was seen to contain a small quantity of pus, which subsequent examination proved to be tuberculous. In a third case, in which a growth in the orbit was causing proptosis, there was some uncertainty as to whether the

eye was involved or not. Transillumination could not be used, as the lens was opaque; the pupil was dilated and tension +1, the cornea was insensitive. When the author focussed the light upon the pupil, the sclera was found to be translucent everywhere, except at one small spot situated 8mm. below the cornea. When eye was removed along with the growth, the former contained a small melanotic sarcoma, so small that in all probability it would have been missed with a transilluminator.

PERCIVAL J. HAY.

V.—THE SPIROCHÆTA PALLIDA.

- 1) McKee, Hanford.—Demonstration of the spirochæta pallida from a mucous patch of the conjunctiva. *Montreal Medical Journal*, March, 1909.
- 2) Botteri, A.—A case of sclerosis of the plica semilunaris and of the tarsus, with demonstration of the spirochæta. (Ein Fall von Sklerose der Plica semilunaris und des Tarsus mit Spirochætenbefund.) *Klin. Monatsbl. f. Augenheilkunde*, April, 1909.
- (3) Coles, Alfred C.—Spirochæta pallida: methods of examination and detection, especially by means of the dark-ground illumination. *British Medical Journal*, May 8th, 1909.

(1) A female, 25 years of age, was the subject of acquired syphilis, and "her mouth was a mass of mucous patches." The conjunctival surface of one lower eyelid presented in its outer fourth an oval area of peculiar pale-blue colour, contrasting markedly with the surrounding reddened conjunctiva. The lid was somewhat swollen, and the eye was watery. From the clinical condition of the patient and the appearance of the eyelid, McKee (Montreal) diagnosed a mucous patch of the conjunctiva. Slides were prepared from the patch, and stained by Giemsa and modified methods. Numbers of spirochætae were found in all these preparations, six or seven typical spirochætae being seen in some fields.

SYDNEY STEPHENSON.

(2) Botteri (Innsbruck) reports the case of a man 34 years of age, who presented three typical hard chancres (assigned to a razor-cut while shaving) upon the right side of the chin. In addition, the semilunar fold and caruncle of the right eye were diffusely infiltrated, although not ulcerated, and a hard, painless swelling could be felt in the tarsus of the left lower lid. The regional lymph glands were enlarged. Roseola was present on the trunk. Spirochætes were numerous in smear preparations made from the eye lesions and stained in accordance with the Giemsa method.

SYDNEY STEPHENSON.

(3) Coles (Bournemouth) gives minute directions as to obtaining, staining, and examining material for the spirochæta pallida, and ends a most practical article with the following conclusions:—

CONCLUSIONS.

1. The easiest, quickest, and by far the most certain method of detecting the *spirochæta pallida* is by the examination of cover-glass preparations made from the serum, by means of dark-ground illumination.
2. That the most important part of the whole procedure is the correct taking of the material, whether for fresh or dry film preparations.
3. That it is not essential to examine fresh films (which have been rung round with vaseline) at once, as the organism may be recognised some days later.

TRACHOMA.

DR. W. CLAUSEN.]

[DR. W. CLAUSEN.



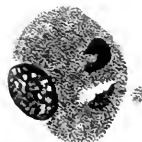
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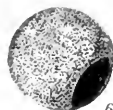
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4. That the serum of irritation may be conveniently taken in capillary tubes or blood capsules, provided the ends are sealed, and cover glass preparations made from it may be examined at leisure.

5. That whilst the finding of the *spirochæta pallida* indicates, as far as our knowledge goes at present, syphilis, a negative examination is of little value; at most it only justifies a suspicion that the disease is not present.

SYDNEY STEPHENSON.

VI THE ÆTIOLOGY OF TRACHOMA.

(1) Herford, E.—Contributions to the investigation of trachoma. (Beiträge zur Trachomforschung. *Klin. Monatsbl. f. Augenheilkunde*, März, 1909.

(2) Clausen, W.—Upon the ætiology of trachoma. (Zur Ætiologie des Trachoms. *XI Congresso Internazionale di Oftalmologia*, 1900, fascicolo secondo, p. 354.

(3) Greeff.—The Infective Agent of Trachoma. *Lancet*, April 17th, 1909.

1. Herford, a pupil of Greeff, gives a description and coloured drawings of the so-called trachoma bodies. He found these granular cell inclusions in all fresh untreated cases of trachoma, using Giemsa's older method of staining. In order to place the specific nature of these bodies upon a solid foundation, Herford proceeded to examine secretions and epithelial scrapings derived from cases of non-trachomatous conjunctivitis and from normal conjunctivæ. More than a hundred films were prepared, but the result was negative, although granules of a different kind were sometimes seen. The irregular size and decidedly red colour of the latter serve to distinguish them from the granules seen in trachoma. Two monkeys were inoculated with trachomatous material; one animal remained quite healthy; in the other occurred an acute conjunctivitis of comparatively short duration. In the latter, trachoma bodies were invariably found on repeated examination. Herford is quite convinced of the specific nature of the bodies, and speaks of them as parasites. But their specific nature appears to the reviewer to be one thing, their parasitic and causative nature another.

C. MARKUS.

(2) In the study of trachoma, from the point of view of the parasitic and probably specific nature of certain small granules, the Prawozek bodies found either free or within the cells of the discharges, a considerable initial difficulty must be overcome by the observer, in acquiring sufficient acquaintance with the appearances presented by the various phases of this alleged parasite, before the problem of their regular appearance or specific nature in trachoma can be approached. A further complication is introduced by the diversity of the granules which can appear in any incipiently degenerate cell.

Clausen's paper is illustrated by a plate, and affords valuable information on some of the difficult points. In the earliest stages of the life history the granules lie free in the secretion, scattered through the protoplasm of the epithelial cells (Fig. 1, or in clusters (Fig. 2) adjacent to the nucleus, but separated from it by a narrow zone of clear protoplasm. As the parasite develops, the granular intracellular mass increases in bulk (Figs. 4 and 5, until it completely fills the cell (Figs. 6 and 8, finally either destroying the nucleus (Figs. 9 and 10, or rupturing the cell envelope, so that the fine granules are extruded into the secretion (Fig. 7). The cluster of granules in the cell may appear to be in a vacuole (Fig. 4, and as the granules when free

in the secretion may still be grouped in clusters, there is always a distinct tendency to a diplococcal arrangement. The life-history of the parasite, while in the conjunctiva, is clearly shown by the series of sketches, which are made from slides, and are not diagrammatic.

The staining method is as follows.—The conjunctival secretion, spread on a cover-glass, is dried and fixed for 30 minutes in absolute alcohol. The stain must be freshly prepared every time, and thoroughly mixed; the cover-glass is floated, film down, on the surface of the staining solution, and the whole covered up for 6 to 9 hours. The stain consists of: (a) 12 parts Giemsa's cosine solution (2·5 ccm 1 per cent. French cosine in 500 ccm. distilled water); (b) 3 parts Azur I. (1:1000); (c) 3 parts Azur II. (0·8:1000). After staining 6 to 9 hours at 37°C., the films are washed with distilled water, dried, and mounted in cedar oil. If the staining temperature be 50°C. the time is reduced to 3 hours.

With regard to the diagnostic value of the granules when found, Clausen says: "The individual granules cannot be recognized with certainty, or considered as forming a standard for the diagnosis of trachoma, but when the specific granules are present, whether the small or large ones, absolutely specific clusters of them (*Trachomkörperchen*) can be found near the nuclei of the epithelial cells, or else lying free" (cp. 2 and 3). He quotes cases in which the diagnosis of trachoma was made or rejected on the strength of these appearances.*

ANGUS McNAB.

3) Professor Greeff of Berlin, writing to the *Deutsche medizinische Wochenschrift*, reports that he has detected the infective agent of trachoma. These bodies are small and round, much smaller than the smallest micrococci hitherto known. They may be stained very strongly after Giemsa's method but not after Gram's method, and appear sometimes more violet, sometimes more reddish. They are surrounded by a distinctly light circle; and under the highest powers it is seen that they are not circular but more oval like bacteria with rounded edges and they tend to congregate like diplococci. In the later stages of the disease they are present in crowds within the cells. They were found in the follicle, both within and without the cells, in the epithelium, and in the discharged fluid. By using other diseases of the eyes and normal eyes as controls it was ascertained that the above bodies were not present except only in trachoma. The demonstration of these bodies is difficult and the procedure described by Professor Greeff is rather complicated. Fresh cases without previous treatment must be taken, the bodies in question being no longer visible after some days' treatment by caustics. They have by that time disappeared from the superficial layers of the tissues but continue to be present within the deeper layer, where they increase and produce relapses.

AGE FREQUENCY IN DISEASES OF THE EYE.

Dutoit, A. A.—The relation of frequency and periodicity to age in diseases of the eye. Ueber die Beziehungen der Frequenz und der Periodicität der Augenkrankheiten zum Lebensalter, *VI Congresso Internazionale di Oftalmologia*, Fascicolo Secondo, 1909, p. 488.

The incidence of syphilitic and tuberculous affections of the eye, according to age periods, as shown by Swiss statistics, is considered by Dutoit Burgdorf.

*This point has been considered in THE OPHTHALMOSCOPE, 1909, p. 201.

and the following conclusions are arrived at.—Syphilitic eye affections of the hereditary types occur up to 25 years of age. In the first decade keratitis parenchymatosa prevails, and in the second decade irido-choroiditis and chorioretinitis, the latter sometimes passing on to ascending atrophy. The maximum of hereditary syphilitic eye affections is at the end of the second decade, and is due to chorioretinitis. The frequency of acquired syphilitic affections begins to be obvious in the third decade, the form being irido-choroiditis and chorioretinitis with some cases of atrophy; in the fourth decade uveitis is the chief affection, with descending atrophy beginning and increasing into the fifth decade, which is the maximum of syphilitic eye affections.

The question is more complicated in regard to tuberculosis, there is a definite frequency, in the first decade, of keratitis parenchymatosa; and in the second, irido-choroiditis and chorioretinitis which continues up to the end of the third, when the maximum frequency of tuberculosis of the eye is reached. The age disposition of tuberculosis in general agrees with the periodicity of tuberculosis of the eye, and also with that of those acute infectious processes which so often render tuberculosis manifest. In tuberculosis of the eye there are three possibilities: (1) that it is an indirect hæmatogenous metastasis, (2) the tubercular ophthalmitis is the only localization of the endogenous infection, or (3) it is a metastasis from some other focus.

Patients with keratitis parenchymatosa usually show other signs of a general more or less latent tuberculosis, and also of conditions associated with some acute infectious process, apparently the predisposing and the exciting causes. On the other hand, irido-choroiditis and chorioretinitis attack apparently sound individuals, and as a direct metastasis from a tubercular lung or joint to the eye is very rare, we must conclude that these affections are isolated manifestations, although certainly in hereditarily predisposed persons.

In plotting out curves of diseases according to age, the maximum incidence of uveitis corresponds to that of irido-choroiditis and chorioretinitis tuberculosis at the end of the third decade; and the maximum of optic atrophy corresponds to that of descending degeneration from acquired syphilis at the end of the fifth decade.

The information gathered in this statistical manner regarding tuberculosis and syphilis is so striking that the line of research should be pursued.

ANGUS MCNAB.

VIII.—CHOKED DISC.

- (1) de Schweinitz, G. E. and Holloway, T. B.—The operative treatment of papillo-œdema (choked disk), with special reference to decompressing trephining. *Transactions College of Physicians of Philadelphia* 1908.
- (2) Cushing, Harvey and Bordley, James Jr. Observations on experimentally induced choked disc. *Bulletin of the Johns Hopkins Hospital*, April, 1909.

1. de Schweinitz and Holloway's article is in part a report of a case that has been written recently on the operative release of intra-cranial tension for the cure of "choked disc," or "papillo-œdema," not due to a cerebral tumor.

constitutional disease, but depending upon increased intra-cranial tension; and in part a statement of certain propositions—and cases illustrative of them—bearing upon the subject.

The authors accept the views of Schmidt-Rimpler and Manz, Bordley and Cushing, that the marked edema of the nerve-head is primarily due to a distension of the sheath of the optic nerve, caused by the increased subarachnoid fluid being forced into this situation under the influence of elevated intra-cranial pressure, and therefore prefer the terms "choked disc" and "papillo-edema" (Elschnig) to the less accurate terms, "optic neuritis," "descending neuritis," and "papillitis." They then pass on to a consideration of the ophthalmoscopic appearances of the nerve-head, which indicate operative interference, basing themselves largely upon R. Marcus Gunn, as well as upon Bordley and Cushing. It is obvious that there are considerable difficulties in the diagnosis of incipient choked disc, and these are pointed out, although not, unfortunately, entirely cleared away. Two or three paragraphs follow concerning the date of occurrence, and character of the nerve-head changes, and the vision. These paragraphs are largely grounded upon the work of Gunn, Bordley and Cushing, and Leslie Paton. The authors say "It is not possible to predict how soon after a tumour develops, changes in the nerve-head will begin to appear It is not possible to determine from the stage of the retinal process what the duration of the cerebral lesion is, nor can we predict in the case of tumour in the absence of choked disc when this is likely to occur Choked disc caused by intracranial growths is perfectly compatible with good acuteness of vision and . . . this may exist for long periods of time, although there is well-marked engorgement of the nerve head. . . . The important point is that good vision must not be permitted to stay the hand in operative interferences, because what is good vision to-day, may in a few days be poor vision, and already those processes may have started which, if unchecked, lead to the degenerations of the nerve, which ultimately end in blindness and atrophy."

They then set forth, as mentioned earlier, what they call "propositions" with illustrative cases. Briefly, these propositions concern the following points: (1) The effect of operation on the preservation or restoration of sight. (2) The danger to vision of delay in operation. (3) The preservation of existing vision, even when poor, by decompressing trephining. (4) The occasional delay in the restoration of vision after operation. (5) Increase in papillo-edema and visual disturbance following decompressing trephining. (6) Preservation of vision in one eye only by decompressing trephining. (7) Loss of vision (previously good) after operation. (8) The earliest date of subsidence after operation. (9) The indications given by the disc appearances as to the size and situation of the growth. (10) Delay in the development of the optic disc changes. It seems probable that in myopia the disc changes do not develop as quickly as in other types of refraction. According to Singer, the absence of disc-edema in intracranial tumours—other than pontine—is rare in cases under forty years of age, and becomes increasingly more frequent after that period.

The authors draw the following general conclusions:—(1) The most satisfactory treatment for the purpose of preserving vision in any case of choked disc or papillo-edema, not due to a toxic process or constitutional disease, but depending upon increased intracranial tension, is decompressing trephining, with the removal of the growth if it is accessible. (2) This operation should be performed early, and if it can be done during the first, second, or even third stage of papillo-edema,* the prognosis as to sight is not

*The stages of papillo-edema are in accordance with the descriptions of R. Marcus Gunn

favourable. (3) If for any reason the operation is postponed until the development of the fourth and fifth stages of papillo-œdema, already associated with marked depreciation of vision, the prognosis as to sight is unfavourable; but, even under these circumstances, the operation should be performed, because it sometimes preserves such vision as still remains, and if it should happen to be followed by a rapid deterioration of vision, as, unfortunately is apt to occur, it at least gave the patients a chance, because without it they are doomed to blindness. (4) The investigation of the eyes under the circumstances must include, not only an ophthalmoscopic examination, but one which includes a careful investigation of the visual field, the colour perception, light-sense, size of the blind spot, etc. (5) Patients afflicted with papillo-œdema dependent upon increased intracranial tension, should have the case fairly stated to them, and the operation should be urged in spite of occasional unfavourable results because in its absence ultimate blindness is almost sure to result.

ERNEST THOMSON.

(2) The experiments of **Cushing** and **Bordley** aim at clearing up the question as to which of the two conflicting views is correct as to the ætiology of the fundus changes in cerebral tumour. These well known views are: (1) that the changes are due to mechanical causes, (2) that they are toxic or inflammatory in origin. In order to avoid confusions in terminology which have arisen through the acceptance by various writers of one view or the other, e.g. "choked disc," "papillo-œdema," on the one hand, "neuritis," "papillitis," on the other, the authors declare their intention of making use of the term "choked disc" to indicate the entire process, embracing all grades of the retinal lesion, from the earliest congestion to the final destruction of the optic fibres. Previous to undertaking experiments on animals (dogs, Cushing and Bordley admit that they were prejudiced in favour of a mechanical explanation for the following reasons.—(1) The eye-grounds in most cases of cerebral trauma show evidences of stasis, which may rapidly lead to œdema. In these cases the neuro-retinal lesion, which is indistinguishable from certain grades of "optic neuritis," cannot be due to other than the mechanical influence of increased intra-cranial tension, and prompt operative relief from the pressure leads often to a prompt subsidence of the congestion and œdema of the nerve head. (2) The frequency of similarity of the eye-grounds in patients with cerebral tumour and in patients with nephritis accompanied by headache and vomiting. The neuro-retinal changes in nephritis can often be temporarily modified by lumbar puncture, and may be permanently modified by cerebral decompression. (3) The authors have seen a great number of instances of partial or total subsidence of a choked disc after simple decompression.

The experiments undertaken on dogs anaesthetised by ether after stupefaction with chloroform were of several kinds. A. In order to show *the effects of an acute increase of tension from the subdural introduction of fluid*, a trephine opening was made over the parietal eminence, the underlying circle of dura cut away, and a snugly-fitting canula screwed into the cranial opening until its inner end was flush with the dura. A long rubber tube connected this canula with a pressure flask containing normal saline at body temperature. A mercury manometer was introduced into the circuit and by raising and lowering the flask the pressure employed could be varied and recorded. Sometimes formalin, 4 per cent. solution, was used instead of saline with the object of fixing the œdematous retinal tissue under the conditions of the experiment. Appearances were watched ophthalmoscopically. B. To determine *the effects on the eye-grounds of simple acute decompression associated with the artificial introduction of fluid* a one inch trephine opening was made

in the mid-line just anterior to the occipital protuberance, exposing the longitudinal sinus and a portion of dura over each hemisphere. Pressure with the finger was then exerted over the exposed dura, while the eye-grounds were observed. A few minutes of pressure sufficed to produce 2D. of swelling of the disc. A stronger pressure, continued for some time, increased it to 7D., with the associated characteristic appearances. On releasing the pressure, the venous engorgement rapidly subsided. Repetition of the pressure produced retinal oedema as well. This subsided in an hour after relieving the pressure. (c) Experiments of the type (A) and (B), with the optic nerve and eyeball exposed from the side in order to observe directly the effect of intracranial pressure on the vaginal sheath itself.

From the foregoing types of experiments (the detailed results of which cannot well be quoted in an abstract), it was apparent that a *neuroretinal oedema with marked elevation of the papilla may accompany conditions which raise intracranial pressure, whether from the introduction of new fluid under tension or from transmission of tension to the fluid already present*; and, furthermore, *that coincident with (possibly antecedent to) the production of the neuroretinal change there will occur a visible distension of the optic sheath.*

(b) To attempt to determine the effects of venous stasis alone, experiments were made (a) with a blood-pressure band encircling the neck, and (b) the trachea having been isolated, with an elastic tourniquet tightly bound round the cervical structures. Experiments of this type showed that *simple stasis in the retinal veins fails to produce anything more than the condition of venous engorgement which accompanies a choked disc, and never leads to a definite oedema of the papilla.* The authors recognise that these observations—on the dog—are not entirely conclusive in eliminating venous stasis as a primary factor in the production of choked disc, although the comparative ease with which the condition is produced by cerebro-spinal fluid stasis, and the difficulty with which it is produced by venous stasis, indicates what, in all probability, is the essential element.

(E) In order to attempt to reproduce the histological alterations in the disc which characterise the long-standing choked disc of tumour in man, a bilateral cranial defect, with removal of a considerable area of bone, was produced and allowed to heal. The animal was then put under morphia and kept so; a head bandage was applied with pads over the defects, so as to keep up a moderate degree of pressure. The pressure was maintained most of the time during a period of three weeks. Histological examination showed swelling of the disc, and marked separation of the tissues of papilla and retina by oedema. There were numerous small extravasations of blood, and beginning round-cell infiltration. Therefore, *long continued pressure against a dural defect can lead to retinal hemorrhages and other clinical as well as histological features which characterise chronic choked disc in man.*

(F) Experiments, with the object of more closely simulating the conditions present in tumour by the introduction within the cranium of a foreign body, e.g., fragments of dry sponge tent were introduced between bone and dura over the left hemisphere. The result was "choked disc" on both sides, which persisted for a fortnight, after which the animal was killed. Histological examinations showed marked oedema of neuro-retinal tissues and beginning round-celled infiltration. In another experiment the sponge tent fragments were introduced, through an opening in the left occipital base, between the bone and the dura. Choked disc was produced *inter alia*. This entirely disappeared in a fortnight, and when the animal was killed, there were no evidences even of stasis in the retina. Conclusion, *that the introduction*

between the skull and dura of foreign bodies, which are capable of subsequent increase in size and which possess some elasticity, will closely simulate the action of a new growth, and, placed either above or below the tentorium, will lead to the production of choked disc.

The authors, finally, state their conclusions:—“(1) That the occurrence of the neuro-retinal edema is primarily dependent on the passage of cerebro-spinal fluid, under tension from the subarachnoid spaces of the interpeduncular region into the vaginal sheath of the optic nerve, and that cerebral decompression often allows the process to subside, owing to a resultant diminution of tension from release of the confined fluid. (2) That the experimental work corroborates many of the more recent clinical observations in showing that a choked disc, even of considerable height, may be rapid in its formation and, provided it has not gone on to the stage of new tissue formation, may rapidly subside; and thus speaks strongly in favour of a mechanical, as opposed to a chemical or inflammatory origin for the lesion.”

ERNEST THOMSON.

XI.—MARMAROKONIOSIS.

Trantas, A.—The cornea of Marble-Cutters. *La Cornée des Marbriers: Marmarokoniosis.* *XI Congresso Internazionale di Oftalmologia*, 1909, fasc. secondo, p. 339.

Trantas Constantinople has found characteristic lesions in the cornea of such marble-cutters as work without protecting their eyes. The changes were present in 36 of 37 workmen examined by the author.

The changes may be described as follows.—A number of greyish-white points are present in the parts of the cornea exposed to the air, especially towards the centre. The points are often so small that they must be sought by focal illumination and a magnifying glass. But, as a rule, there are also present larger spots or small lines, resembling hyphens or acute accents, and these possess somewhat angular outlines and have a glistening appearance. The lesions are not stained by fluorescein. The condition, which is invariably bilateral, causes little interference with sight, and elicits few complaints from the patients.

Marmarokoniosis obviously results from minute particles of marble, detached during work, becoming fixed in the cornea. The longer the man has been engaged in marble-cutting the greater becomes the number of the deposits, which lie beneath the epithelium in the superficial layers of the cornea. Chemical examination by Vassiliades showed that they were composed of calcium carbonate, *i.e.*, of pure marble. It is a curious thing, as pointed out by Trantas, that the left cornea is more affected than the right, since the last-named is less exposed in marble-cutting, provided the workman is right-handed. In left-handed workmen the right is more affected than the left cornea.

The changes are permanent; and treatment by weak acetic acid appears to do no good.

SYDNEY STEPHENSON.

X.—OPERATIONS FOR GLAUCOMA.

- 1 Lagrange.—A new treatment for simple chronic glaucoma: combined iridectomy and sclerotomy. *Annales d'Oculistique*, février, 1907.
- 2 Fernandez, Santos.—Iridectomy as a prophylactic of glaucoma in anterior synechiæ. *Recueil d'Ophthalmologie*, novembre, 1907.
- (3) Lagrange, Félix.—On the filtering cicatrix in the cure of glaucoma, and its varieties after combined sclerectomy and iridectomy. *Archives d'Ophthalmologie*, février, 1908.
- 4 Rochon DuVigneaud.—The efficacious conditions of Lagrange's irido-sclerectomy. *Archives d'Ophthalmologie*, mars, 1908.
- (5) Krauss, W.—Concerning cyclodialysis. *Zeitschrift für Augenheilkunde*, Juli, 1908.
- 6 Lagrange, Félix.—On simple sclerectomy in simple chronic glaucoma. *Archives d'Ophthalmologie*, août, 1908.
- (7) Herbert, H.—Filtering cicatrices by two methods. *British Medical Journal*, September 12th, 1908.
- 8 Abadie, Ch.—On the pretended filtration of intra-ocular liquids and irido-sclerectomy. *Archives d'Ophthalmologie*, septembre, 1908.
- (9) Valude.—On Lagrange's operation. *Annales d'Oculistique*, septembre, 1908.
- (10) Demicheri.—On the anatomical examination of a glaucomatous eye upon which the operation of irido-sclerectomy had been performed. *Annales d'Oculistique*, septembre, 1908.
- (11) Weekers, L.—On iridectomy in the treatment of hæmorrhagic glaucoma. *Archives d'Ophthalmologie*, octobre, 1908.
- 12 Lagrange, Félix.—Sclerectomy and glaucoma. *Annales d'Oculistique*, novembre, 1908.
- (13) Lagrange, Félix.—On the value of sclerectomy in the treatment of chronic glaucoma. *Archives d'Ophthalmologie*, novembre, 1908.
- (14) Wolfflin, Ernst.—On peripheral iridectomy in glaucoma. *Klin. Monatsbl. für Augenheilkunde*, November-Dezember, 1908.
- (15) Minor, J. L.—Restoration of sight after nearly a month's blindness from glaucoma. *New York Medical Journal*, December 5th, 1908.
- (16) Bettremieux.—The effect of simple sclerectomy on the blood circulation of the eye. *La Clinique Ophthalmologique*, 10 décembre, 1908.
- (17) Rochon-DuVigneaud.—A last word on sclerectomy. *Archives d'Ophthalmologie*, décembre, 1908.
- (18) Abadie, C.—Sclerectomy and Iridectomy in Glaucoma. *Archives d'Ophthalmologie*, janvier, 1909.
- (19) Lagrange, Félix.—On fistulization of the eye. *Archives d'Ophthalmologie*, mars, 1909.
- 20 Holth, S.—On the favourable effect of iridencleisis in cases of chronic glaucoma in which iridectomy and sclerotomy have been unsuccessful. *XI Congresso Internazionale di Oftalmologia*, Naples, April 2-7, 1909, pp. 245-250.

- (21) **Henderson, Thomson.**—The rationale of iridectomy in the treatment of glaucoma. *XI Congresso Internazionale di Oftalmologia*, Fascicolo secondo, Naples, April 2-7, 1900, p. 406.

(1) In the *Archives d'Ophthalmologie* for August, 1906, **Lagrange** (Bordeaux) described a new operative procedure for the treatment of simple chronic glaucoma, and reported 15 cases illustrating its value. He now records five further successful cases. The steps of the operation are: 1. An incision made with Gracé's knife, the puncture and counter-puncture lying 1 mm. outside the limbus; in cutting-out, the knife is turned backwards, so as to cut off a wedge of sclerotic and to make a large conjunctival flap. 2. The conjunctival flap is seized in forceps and pulled down so as to evert the corneal flap, and with very sharp curved scissors a good-sized piece of the anterior lip of the incision is excised, and 3. An ordinary iridectomy is performed. There is a plate containing four excellent figures illustrating the steps of the operation.*

R. J. COULTER.

(2) **Santos Fernandez** finds that many cases presenting leucoma-synechiae are amaurotic quite out of proportion to the damage to the anterior segment of the globe, and when the fundus can be examined, cupping of the disc will be found to explain the amaurosis. This sequel of corneal perforation may occur in adults as well as in infants, and in many cases iridectomy at an early date will save the sight. Besides warding off glaucoma, an iridectomy will relieve the pain which is sometimes associated with these cases.

J. JAMESON EVANS.

(3) For translation of **Lagrange's** communication see THE OPHTHALMOSCOPE, 1908, p. 363.

(4) For abstract see THE OPHTHALMOSCOPE, 1908, p. 522.

(5) **Krauss** (Marburg) criticises Heine's operation of cyclodialysis for the relief of glaucoma. The intention of the operation is to form a permanent communication between the anterior chamber and the suprachoroidal space. Anatomical examination of eyes which have been so treated shews that no such result is attained. The ciliary body is tightly bound down by cicatricial tissue, and any lowering of tension is due to atrophy of the ciliary body.

T. HARRISON BUTLER.

(6) For translation of **Lagrange's** communication see THE OPHTHALMOSCOPE, 1908, p. 779.

(7) **Herbert's** object is to show: (1) the excellent cicatrices obtainable by the "wedge isolation" operation for the relief of glaucoma, and to simplify the description thereof; (2) the results of subconjunctival paracentesis by the author's method. The *technique* of Herbert's wedge operation imperatively demands that the description should be read in the author's words, either here or in THE OPHTHALMOSCOPE, 1907, p. 202. Some other points concerning it should be read here after reading the description. As regards subconjunctival paracentesis, an operation undertaken under certain circumstances for the relief of tension, described in THE OPHTHALMOSCOPE, 1907, p. 209, and in *Cataract Extraction* by the author, Herbert showed a case of chronic non congestive glaucoma in which, with one eye blind and the other progressing towards blindness from restriction of field of vision, he had performed the operation. The visual acuity had risen from $\frac{3}{60}$ to $\frac{3}{6}$, and the field had apparently improved a trifle. **Major H. Smith** retained an open mind on the subject of the wedge operation, and would give it a trial. **Lt.-Colonel Maynard** suggested that, as Colonel Herbert thought the performance of

*The operation was fully described in THE OPHTHALMOSCOPE, 1907, p. 197.

iridectomy was not essential, only non-iridectomised cases should be considered. He had found in Lagrange's operation that it was difficult to know exactly how much sclerotic should be removed. ERNEST THOMSON.

(11) **Valude** (Paris) while praising Lagrange's operation of sclerecto-iridectomy as the best devised for the relief of tension up to the present time, reiterates his opinion that the glaucoma problem is not solved by the establishment of a filtration scar, and quotes two cases in support of his view. In the first of these the patient had had both eyes iridectomised for chronic glaucoma. The operations had both been correctly performed. In the right eye there was a typical filtering cicatrix, while in the left the scar was quite firm, but in spite of this, the tension of the right eye was higher than that of the left. In the second case, in spite of a Lagrange's operation correctly performed, which produced an ideal filtering cicatrix and reduced the tension to normal, the vision, which was 5/10 before the operation, had become reduced to 1/20 four months later. In face of these results, Valude considers that it is unjustifiable to operate on a glaucomatous eye until the vision has commenced to fail seriously, in spite of the use of myotics. R. J. COULTER.

(10) **Demicheri** gives the history of a case of hæmorrhagic glaucoma, treated at the Lariboisière Hospital, in which Morax performed Lagrange's operation (irido-sclerectomy) with the result that the tension was relieved but the eye had to be enucleated 14 days later for persistent pain. The interest of the communication depends on the description of the appearances seen in histological sections through the seat of the operation, which were as follows: 1.—*In the centre of the incision.*—The posterior lip of the wound terminated in a point and was surrounded by the remains of the root of the iris, while the anterior lip, from which the wedge had been excised, was rounded and had its fibres slightly separated. Between the two lips there was a small knob of atrophied iris, outside of which there was a layer of cellular tissue, which became continuous with a quantity of loose vascular oedematous cellular tissue containing cystic cavities and numerous pigmented cells, apparently washed into it from the iris by a stream of fluid. A study of this region left no doubt that there had been a true filtration of aqueous through it from the anterior chamber to the subconjunctival cellular tissue. There was no trace of a communication between the anterior chamber and the sub-choroidal space. 2.—*At the extremities of the incision.*—There was a true incarceration of the iris occupying half the thickness of the sclerotic; there was no cellular tissue separating the edges of the scleral cut and any oedema that was present was evidently due to extension from the centre of the wound.

The author is of opinion that although a scar free from uveal tissue would be preferable, such a limited incarceration as was present in his case covered by a thick layer of cellular tissue in addition to the conjunctival epithelium, would not prove very dangerous nor render the operation a bad one which should not be classed as a Lagrange's operation. He considers that his sections show that the true scleral fistula described by Lagrange does not always persist for long after the operation, but may become filled with cellular tissue derived partly from the conjunctival tissue and partly from the iris, as fibres were passing from the incarcerated iris to the middle of the cystoid cicatrix, and he suggests that it would seem possible that the knob of connective tissue filling the scleral hole might in time become so dense as to block the filtration completely. R. J. COULTER.

(12) **Lagrange**, criticising Demicheri's article, lays it down as a capital point that his operation cannot be considered as having been performed in any case in which there is any incarceration of iris, capsule, or vitreous in the wound. He also points out that Demicheri's case was one of acute glaucoma, a

condition in which he does not recommend his operation. Replying to Valude's criticism, he says that a cystoid cicatrix produced by his operation is quite different from one produced in any other way, and points out that in the case in which he operated on a patient with a vision of 6 to, the operation performed was a sclerectomy without iridectomy.

R. J. COLLIER.

(14) **Wolffin** recommends for simple and chronic glaucoma a modification of the usual iridectomy, which consists in leaving the sphincter intact. He has operated by this method on three cases. Apart from an optic and cosmetic advantage, it is claimed that the post-operative condition is more favourable for the action of eserine, and that a regular coloboma is more easily obtained.

C. MARKUS.

(15) **Minor's** case is of importance in showing the permanent value of iridectomy in subacute glaucoma. Both eyes were involved and "totally blind" for nearly a month's time. Five years later, the right eye retained a post-operative vision of two-thirds of normal in a same sized field. Vision with the left one had gradually fallen from one-half normal after the procedure to the recognition of "hand-movements" at two feet distance.

CHARLES A. OLIVER.

(16) In this short article **Bettermieux** (Roubaix) seems to wish to explain his position on this subject on account of a confusion which has arisen between the writings of himself and Lagrange (see 19 below). The point which **Bettermieux** desires to emphasise is that, in his opinion, sclerectomy* simply acts by improving the blood circulation within the eye, not by favouring the excretion of the intra-ocular fluids through a filtering cicatrix or a fistula. The following are the points in his argument.—(1) In doing a simple sclerectomy on an adrenaline blanched eye there appears, after shaving off some layers of the sclera, a surface about 6 mm. by 2 mm. over which sanguineous oozing takes place. This surface then is put in contact with the conjunctival and subconjunctival circulation and vascular anastomosis should form here. (2) Exner explains the action of iridectomy in reducing tension by supposing that it allows at one part of the iris an anastomosis between arteries and veins. (3) Schoeler has caused glaucoma experimentally by cauterizing the sclera for two millimetres round the cornea; Bartels obtained the same effect by tying the anterior vessels of the eye. (4) A partial burn of the sclero-corneal boundary sometimes causes transitory glaucomatous phenomena. In such cases as these there is an obstacle in the way of the circulation by destruction or blocking of vessels, and it seems logical to seek to cure the glaucoma by improving the blood circulation in the pericorneal zone, and to create, as does simple sclerectomy, in the author's opinion, anastomosis between the deep scleral vessels and the conjunctival and subconjunctival vascular plexus.

ERNEST THOMSON.

(18) **Abadie** (Paris) believes that the curative agent in glaucoma is the iridectomy, and not the scleral fistula following iridectomy, as asserted by Lagrange. He goes even farther, and claims that in simple section of the iris must be sought the true remedial agent. **Abadie** makes his incision in the cornea, and not in the sclera, and removes as little iris as possible. Yet he gets the same successes. A cystoid cicatrix is more likely to occur in very chronic glaucoma than in glaucoma operated upon at an early stage. In cases of simple chronic glaucoma, iridectomy does not give the same favourable results as in other types, but fortunately myotics act well under such

*An account of the *technique* of **Bettermieux's** operation of simple sclerectomy is to be found in THE OPHTHALMOLOGIST, 1908, p. 818.

circumstances. Abadie maintains that Lagrange's operation of irido-sclerectomy, whilst it cures cases of chronic glaucoma, does not cure cases of simple chronic glaucoma. Abadie regards it as established that: (1) Lagrange has so far failed to furnish satisfactory proof that simple chronic glaucoma can be cured by sclerectomy; and (2) glaucoma cured by sclerectomy or by irido-sclerectomy might have equally well have been cured by iridectomy, a simpler and less dangerous operation, which has held its position in every part of the civilized world for upwards of fifty years.

SYDNEY STEPHENSON.

19) This communication, presented by **Lagrange** (Bordeaux) to the forty-fourth meeting of the American Ophthalmological Society, is divided into two parts.—I. A definition of the scientific terms employed in speaking of so-called fistulization of the eye by means of sclerectomy, and II. An anatomical and experimental demonstration of the process.

I.—Lagrange defends his use of the words "simple chronic glaucoma," called into question by Abadie (see 18 above), to describe the cases cured by his operation of irido-sclerectomy. He claims that he has used the expression in its recognized sense and acceptation, and that he has cured such cases by his operation. In chronic glaucoma with tension, Lagrange makes the sclerectomy first, and the iridectomy afterwards, so that the best term to define the procedure is "sclerecto-iridectomy." The expression "irido-



FIG. 2.

sclerectomy," on the contrary, is bad, since it leaves one uncertain whether the iris has been merely divided or actually resected. In chronic glaucoma, not associated with notable tension, Lagrange performs simple sclerectomy, involving the entire thickness of the sclera. This operation must be distinguished from Bettremieux's simple sclerectomy (see 16 above). As to the vexed question of a so-called "filtering cicatrix," Lagrange defines his position and defends his use of the expression. The filtering properties of a cicatrix, however, may be temporary. The expression *fistulous cicatrix* implies a fistula produced by imperfect cicatrization, such

as follows resection of the sclera. But to Lagrange, "fistulisation of the eye" appears to be an even better expression to indicate what he aims at when he performs sclerectomy.

II.—Anybody who looks attentively at an eye which has been subjected to simple sclerectomy or to sclerecto-iridectomy, performed in accordance with Lagrange's directions, will be able to convince himself that an opening has been made in the region of Schlemm's canal, the effect of which is to open up communication between the anterior chamber, on the one hand, and the subconjunctival spaces, on the other. In support of his views, Lagrange publishes illustrations of sections from the eye of a dog upon which sclerecto-iridectomy was performed in August, 1907, and which was removed in July, 1908—that is to say, after an interval of eleven months, during which the eye remained quiet with normal tension and apparently good sight; a filtering cicatrix was present. Examination showed that there existed beneath the conjunctiva larger or smaller cavities communicating between themselves and also with the anterior chamber by means of a relatively large neck (*goulot*). The specimens show plainly enough the existence of a subconjunctival fistula connecting the conjunctival spaces with the anterior chamber. In addition to this, the choroidal spaces could be seen to communicate with the anterior chamber. The subconjunctival meshes, distended by fluid from the anterior chamber, presented the structure of serous cysts. In Lagrange's specimens (of which one is represented on p. 442) the walls of the spaces were neither thickened nor covered with epithelium, although obviously that might have taken place had the animal been allowed to live longer than eleven months after the operation.

SYDNEY STEPHENSON.

(20) In Holth's experience, the effect of iridectomy in chronic glaucoma is, as a rule, not a permanent one. On the other hand, he has had good results from his own operation of irido-enceleisis.* Some of his critics appear to have attributed his failures with iridectomy to faulty *technique*, and the object of the present paper is to confound his critics by citing cases which had been operated on by surgeons whose skill could not be questioned, but in which, nevertheless, the beneficial result of iridectomy was only of a temporary character, whereas irido-enceleisis performed afterwards by the author reduced the tension permanently. The first of the cases mentioned was seen by the author fifteen years after iridectomy had been performed on both eyes. On examination, he found R.V. $\frac{5}{6}$ with correction, R.T. 38 mm. Hg, visual field much contracted; L.V. 0, L.T. 51 mm. Hg. After irido-enceleisis: R.V. $\frac{5}{4}$ with correction, R.T. 15 mm. Hg, field of vision considerably larger. In the second case iridectomy had been done in the right eye, and iridectomy followed by sclerotomy in the left eye. When the author saw the patient three years afterwards, he found R.V. 0, R.T. 51 mm. Hg; L.V. $\frac{5}{6}$ with correction, L.T. 37 mm. Hg, field very much contracted. After irido-enceleisis had been performed on the left eye, L.V. $\frac{5}{4}$ with correction, and L.T. 18-21 mm. Hg. The author considers that there is no danger attached to the operation, provided that (1) iridectomy is done at the same time, and (2) the operation is performed subconjunctivally. He has performed the operation in 41 cases before 1906, and in 87 cases since then, and has not lost an eye from the operation. In 75 of the second series of cases normal tension (*i.e.* below 25 mm. Hg) was obtained; in 24 of them the tension did not become normal until after a lapse of one or more months, during which a myotic had to be used to keep the tension normal. The operation is not recommended in cases of glaucoma secondary to irido-cyclitis.

PERCIVAL J. HAY.

*For a full account of Holth's operation see *The Ophthalmologist*, 1907, p. 377.

(21) **Henderson** (Nottingham) brings forward and welds together his various communications dealing with the anatomical conditions observed after iridectomy that have appeared in the pages of *THE OPHTHALMOSCOPE*, the *Transactions of the Ophthalmological Society*, and elsewhere, and gives the following summary of the way in which iridectomy acts in glaucoma:

1. In the healthy iris the cut surfaces forming the base and pillars of the coloboma do not cicatrize.

2. In performing an iridectomy minute lacerations and rents are created throughout the whole iris circumference—"traumatic crypts."

3. In glaucoma, sclerosis of the cribriform ligament closes Schlemm's canal to the aqueous and therefore its only exit is by way of the iris crypts and absorption by the iris veins.

4. As the aqueous drainage is conducted by veins, no remedial measure that does not facilitate the access of aqueous to veins can be expected to have any permanent effect.

5. The result of a glaucoma iridectomy is greatly to facilitate the access of the aqueous to the iris veins and therefore its absorption.

6. In chronic glaucoma with atrophic and sclerosed condition of the iris tissue, a process of cicatrization follows iris wounds and renders iridectomy ineffective.

SYDNEY STEPHENSON.

XI.—OPHTHALMIA NEONATORUM.

Harman, N. Bishop.—The prevention of Blindness due to Ophthalmia of the New-born. *Medical Press and Circular*, April 14th, 1909.

Harman (London) once again urges forcibly the necessity of preventing ophthalmia neonatorum. He reiterates his experience, which is to the effect that the disease in question is the cause of 36.36 per cent. of the cases of blindness amongst the inmates of the County Council Schools for the Blind. Indeed, "if all those who, in later years, would pass as bad-sighted, and not as blind, were eliminated, the percentage of blindness from ophthalmia neonatorum would exceed 40 per cent." Applying these data to the entire census population of England and Wales, he estimates that in the year 1901 there were 1,000 to 2,000 persons who had been blinded by the disease. His enquiries lead him to believe that, roughly, of every hundred children born one contracts the disease, and of every 2,000 born one is blinded or partly blinded by the disease. According to Harman, 80 per cent. of the cases are due to the gonococcus, the remaining 20 per cent. being due to the Koch-Weeks' bacillus, the colon bacillus, or the pneumococcus. His estimate, it will be observed, takes no cognisance of the amicrobic cases of ophthalmia neonatorum, believed by Alt and by Groenouw to account for about 17 per cent. of all cases. The examination of film preparations of discharge from the conjunctiva, so Harman claims, is a sufficiently accurate means of detecting the causal micro-organisms. By way of showing that the dangers of the disease are not invariably confined to the infant himself, the author mentions a case where the malady spread from the baby first affected to the mother and to three sisters. Poverty and neglect tend to increase the liability to ophthalmia neonatorum.

Prevention.—The obligatory adoption of the Cr  d   method is condemned on the twofold ground—first, that there is no general liability to ophthalmia neonatorum; and, secondly, that the plan is not a certain preventive of

ophthalmia. Speaking on the first point, Harman says:—"To brand the whole community because of a relatively few sinners would be as absurd as to damn with faint praise the pleasant lake of Windermere, because we find on part of its leeward shore a filthy scum of froth and rotting weed and stinking fish" (*sic*). In presumably normal births, the baby's eyes should be wiped clean with dry cotton-wool, and Condy's fluid (strength not specified) should be allowed to run into the eyes. When infection is suspected, silver nitrate, 2 per cent., should, in addition, be applied as advised by Cr  d  . The compulsory notification of ophthalmia neonatorum is advocated. As a preliminary to treatment, the nature of the disease should be diagnosed bacteriologically, and the child should then be treated by a private practitioner or, failing him, by medical men deputed by the Midwives' Supervision Boards or by a public hospital. Failing these measures, mother and child might be removed to a Poor-Law Infirmary or some such other convenient place. Results should be notified, and published with the returns of infectious diseases.

SYDNEY STEPHENSON.

XII—CORNEAL OPACITIES AND VISUAL ACUITY.

Pfalz—On the relation of corneal opacities to visual acuity. *Bericht der Ophthal. Gesellschaft in Heidelberg*, 1908. Volume published in 1909, p. 17.

For some years **Pfalz** (D  sseldorf) has made a practice of carefully drawing all opacities of the cornea which were in the pupillary region. He has also made accurate measurements with the ophthalmometer, and has regularly used the keratoscope. He has discovered that alterations in the surface of the cornea, irregular astigmatism, and facets are far more deleterious than mere nebulae. If a nebula causes great lowering of visual acuity, the surface will almost invariably be found to be irregular. He summarises his results thus—1. Superficial opacities which do not trench much upon Bowman's membrane do not leave, when all inflammation is over, much alteration in corneal curvature, and if they do not occupy more than one-fifth of the pupillary area have no appreciable effect upon the visual acuity. 2. Larger opacities of the same nature do influence vision unfavourably, but if one-fifth of the pupillary region remains clear and its curvature remains regular, the acuity does not fall lower than 1/2 to 1/3. 3. In the presence of thick permanent leucomata, apart from the presence of foreign substances, such as lime or lead, there is deep cicatrizing of the cornea, which always has a pernicious influence upon the curvature of the cornea. But even in such cases, after a lapse of time, the irregular astigmatism tends to become more regular, and may then be considerably improved by the use of appropriate cylinders. In these cases if one-fifth of the pupil remain clear, vision may reach 1/5 or 1/4, or not infrequently even more. 4. Even in total diffuse nebulae, as long as they allow disc and vessels to be seen by the direct method, and when the surface is regular, acuities of 1/10 and more may be reached, enough, in fact, to allow of good binocular vision.

T. HARRISON BULLER.

XIII.—GONORRHOÆAL KERATITIS.

Lint, A. van.—Metastatic keratitis of blennorrhagic origin. (*La Kératite blennorrhagique metastatique.*) *XI Congresso Internazionale di Oftalmologia*, 1909, fasc. secondo, p. 536. 32

In view of the rarity of gonorrhœal keratitis,* some details of van Lint's cases may be of interest. The sequence of events was—gonorrhœa; bilateral metastatic conjunctivitis; arthritis; unilateral keratitis, associated with intense photophobia. The surface of the cornea was covered with small vesicles, the size of a pin's head, which were replaced at the end of a couple of days by small superficial ulcerations, with radiated edges. There was neither ciliary injection nor any modification in the ocular tension. Five days later the ulcers were healed, and the consecutive diffuse cloudiness of the cornea disappeared about fifteen days after the commencement of the keratitis.

Brief details of the cases follow:—

CASE No. 1. A man, aged 30 years, was affected with metastatic conjunctivitis of both eyes some thirteen days after he had contracted urethral gonorrhœa. Gonococci were not found in the conjunctival secretion. About a month after the onset of the gonorrhœa (the eyes being then better), arthritis of the right knee supervened. Three weeks afterwards, photophobia was complained of, and, on examination, the surface of one cornea was found to be covered with tiny vesicles, which were crowded together towards the centre of the cornea. No ciliary redness. Two days later, the vesicles were replaced by ulcerations which healed in five more days. A central dulness of the cornea, remaining from the ulcerations, eventually disappeared.

CASE No. 2. —A man, aged 25 years, developed acute metastatic conjunctivitis of both eyes (without gonococci) 10 days and arthritis of the right wrist 22 days after the onset of urethral gonorrhœa. Three days later the right knee became involved, the conjunctivitis meanwhile having undergone cure. Six days afterwards, intense photophobia, with multiple vesicles of the right cornea, which three days later had become ulcerated. No ciliary redness. The cornea cleared, but an attack of irido-cyclitis of the other eye came on 120 days after the gonorrhœa was first noticed.

SYDNEY STEPHENSON.

XIV.—EYE AFFECTIONS IN CHOREA.

Babonneix, L. and Bernard, L.—Eye affections in chorea. (*Les troubles oculaires dans la chorée.*) *Gazette des Hôpitaux*, 13 et 15 avril, 1909.

Babonneix and Bernard note, in the first place, that the following eye conditions have been recorded as occurring in chorea, namely, inco-ordinate movements and retinal paralysis (Secé, 1856), bilateral mydriasis, optic neuritis, embolism of central retinal artery, chorea of the iris, rheumatic iritis, hippus. Turning to their own observations, the authors say they have never seen iritis, and the only case they have found in literature is Forster's (abstract in *British Medical Journal*, 7th March, 1903). Anaesthesia of the conjunctiva occurred 15 times in 20 cases. Pupillary affections are not uncommon: reference is made to Cadet de Gassicourt's case in which periodic obscuration of vision corresponded to dilatation of the pupil; when the dilatation ceased the vision returned. Other and various pupillary phenomena have been recorded. In their own cases, however, twenty-seven in number, Babonneix and Bernard only observed mydriasis twice, pupil inequality twice, and hippus three times. Optic neuritis they have never seen. Paralysis of eye muscles does not occur; there are no records of it; and the authors have never seen it.

ERNEST THOMSON.

*For an account of keratitis in the course of constitutional gonorrhœa, see *A Study of the Ocular Manifestation of Systemic Gonorrhœa*, by Dr W. G. M. BYERS (review in *OPHTHALMOSCOPE*, 1908, p. 479) S.S.

XV—THE ÆTIOLOGY OF CHALAZION.

Lafon, C.—The ætiology of chalazion. (*L'Étiologie du Chalazion.*)
Archives d'Ophthalmologie, novembre, 1908.

Lafon (Périgueux) maintains that chalazion is simply acne of the Meibomian glands.* Allowing for the difference in structure and in anatomical position, Lafon believes that there is a complete analogy between the Meibomian glands, on the one hand, and the sebaceous glands of the skin, on the other. The clinical differences between the two affections, acne and chalazion, are more apparent than real. They may undergo fibrous evolution or may suppurate, although the formation and expulsion of pus are much more rapid in the former than the latter. This difference is easily accounted for by the different anatomical conditions. The histological appearances of a recent chalazion bear a striking resemblance to those of acne, as described by Unna (*Die Histologie der Hautkrankheiten*, 1894)—there is the same absence of glandular elements, the same apparent disorder, the same diffusion, the same accumulation of young connective tissue cells, plasma cells, lymphocytoid cells, and giant cells, and, finally, the same evolution towards suppuration or fibrous metamorphosis.

The tuberculous nature of chalazion, as suggested by Baumgarten and Tangel, has been wholly abandoned. The organisms found in the *débris* of chalazion after maceration in ether by Burchardt, Poncet, and Lagrange, have been shown by Vassaux to be particles of nuclear chromatin, an observation confirmed by the author of the present communication. The bacillus found by Deyl and Hala is now known to be nothing more than the xerosis bacillus, which has been identified by several writers in secretion from the normal Meibomian glands. Lafon has failed to find any micro-organisms in old chalazia, especially when suppurating. Even in recent chalazia he has failed to find any special organism by the ordinary methods of staining. But by employing Unna's method of staining the bacillus of acne (colouration by polychrome methylene blue and differentiation by glycerine ether) he found in smear preparations masses of small bacilli identical with those described by Unna-Sabouraud. Without attempting to elucidate the exact part played by this microbe, it is interesting to see that it can be found in chalazion as well as in acne.

In upwards of one hundred patients affected with chalazion, Lafon has found in nearly all symptoms of seborrhœa and in many comedones or acne. In all, without exception, the factors which predispose to seborrhœa were present, especially indigestion, dilated stomach, alcoholism, genital disturbances, or *sédentarisme*.

Lafon recommends that in addition to the local treatment of chalazion, the patient should be treated generally on the lines adopted for those who are affected with seborrhœa or acne. By these means recurrences may be prevented.

SIDNEY STEPHENSON.

XVI—MYASTHENIA GRAVIS.

(1) Batten, Frederick E.—Some unusual symptoms in myasthenia gravis. *Clinical Journal*, February 24th, 1909.

*The analogy between acne and chalazion was first pointed out by Horn (Kranz, *ie. Anst. im Kindesalter*, Tübingen, 1889).

(2) Warrington, W. B.—Case of myasthenia gravis. *Medical Press and Circular*, April 7th, 1909.

(1) In **Batten's** (London) case of myasthenia gravis there were no bulbar symptoms. As regards eye symptoms, it is simply stated that "the patient often sees double, but ptosis is only occasionally present. The movements of the eyeball are normal, but there is some weakness of the orbicularis palpebrarum. . . . The pupils react normally to light and accommodation."

ERNEST THOMSON.

(2) In **Warrington's** (Liverpool) case of myasthenia gravis the movements of the eyes specially affected were the lateral and upward movements, and especially the upward movement of the left eye. There was no ptosis

ERNEST THOMSON.

XVII.—PARALYSIS OF THE SIXTH NERVE FOLLOWING THE INJECTION OF NOVOCAIN.

Ricchi.—A case of paralysis of the sixth nerve following the intradural injection of novocain. (Un caso di paralisi del VI secondaria a rachinococainizzazione.) *Riv. Ital. di Ottal.*, January, 1909.

Anæsthesia produced by the injection of some local anæsthetic into the spinal theca is generally regarded as free from serious risk, but **Ricchi** reports a case in which the injection of 2.5 c.c. of a 4% solution of novocain was followed, after an interval of two days, by paralysis of the sixth nerve and a resulting troublesome diplopia, which persisted as long as the patient was under his observation, a period of nearly three months.

The case is not an isolated one, but the paralysis was more severe and lasting than in the large majority of those recorded.

The chief interest, beyond the mere clinical fact, is in the causation of the paralysis. There seems no doubt that the injection of these local anæsthetics has a definite relation to the loss of power, but it is strange that the sixth nerve should be the one almost always affected; in the 33 cases, once only was the sixth not involved, and in 30 cases it was the only nerve damaged.

The general belief is that the anæsthetic exercises a toxic action on the centre or fibres of the nerves; the delay between the injection and onset, amounting in some instances to 20 days, is a point against direct toxic action. Some surgeons are inclined to suppose a local hæmorrhage; the violent headache which sometimes precedes the palsy is a sign of some severe nervous disturbance. Yet others look for a mild meningitis. On general grounds, a local toxic action seems more likely than a central intoxication. If the centres were affected, it is hardly conceivable that the other nerves, the seventh, the tenth, and the twelfth, should escape. It is not easy to account for the frequency with which the sixth is attacked on any hypothesis; Pechin and Sauvignieu suppose that it results from a disturbance of the internal ear, calling in support the relation between the nucleus of the sixth and the nucleus of Deiters. **Ricchi** throws out as a possible explanation the hypothesis of Férri, that the sixth nerve being for a considerable part of its course in the wall of the cavernous sinus, is more in contact with a mass of blood and therefore more exposed to the action of toxins circulating in the blood than any other cranial nerve.

HAROLD GRIMSDALE.

XVIII.—REMEDIES.

- (1) Ziegler, S. Lewis.—Keratitis Tuberculosa relieved by tuberculin injections. *Ophthalmologr.* April, 1907.
- (2) Fox, L. Webster.—The radical cure of vernal conjunctivitis. *Ophthalmu Record*, November, 1907.
- (3) Konigshofer, Prof.—On specific serum therapy of incipient senile cataracts. *La Clinique Ophthalmologique*, 10 janvier, 1909.
- (4) Scheuermann.—Contribution to paraspecific or polyvalent serum therapy by means of Behring antidiphtheritic serum. Contribution à la sérothérapie paraspécifique ou polyvalente avec le sérum antidiphthérique de Behring.) *La Clinique Ophthalmologique*, 10 février, 1909.
- (5) Dor, Louis.—Wet cupping in ophthalmology. Les ventouses scarifiées en ophtalmologie. *La Clinique Ophthalmologique*, 10 février, 1909.
- (6) Dor, L.—Retinal detachment cured by tuberculin. Décollement rétinien guéri par la tuberculin. *La Clinique Ophthalmologique*, 10 mars, 1909.
- (7) Darier, A. Paraspecific serum therapy by the buccal route. Sérothérapie paraspécifique par voie buccale; mode d'administration; son action intense et rapide sur les processus inflammatoires de l'œil; uveïtes, iritis, iridocyclites, keratites, par infection purement endogène ou médicale. *La Clinique Ophthalmologique*, 10 mars, 1909.
- (8) Coppez, H.—The dangers of Atoxyl as regards the eyes. (Sur les accidents oculaires produits par l'Atoxyl. *VI Congresso Internazionale di Oftalmologia*, 1909, fascicolo secondo, p. 457.
- (9) Morgano, P.—Almateina in eye work. L'almateina in oftalmojatria. *VI Congresso Internazionale di Oftalmologia*, 1909, fascicolo secondo, p. 511.
- (10) Dransart.—A contribution on the prevention and cure of detachment of the retina and the treatment of progressive myopia. Contribution au traitement curative et preventif du décollement de la rétine et au traitement myopie progressive. *VI Congresso Internazionale di Oftalmologia*, Fascicolo primo, April 2—7, 1909, pp. 263—273.

(1) Ziegler Philadelphia points out that tuberculous keratitis closely resembles interstitial keratitis in its clinical manifestations. The most efficient method of making a diagnosis is by the use of tuberculin injections. Not only are tuberculin injections of use for diagnostic purposes, but they may be used therapeutically. Two minims of Koch's tuberculin are sufficient for a diagnostic test, while from two to five minims may be injected for therapeutic effects. In the case which Ziegler relates examination of the sputum and urine yielded no result *quâ* tubercle bacilli; the pulmonary signs were normal, and there were no enlarged glands. The ocular inflammation, which began as what appeared to be phlyctenular conjunctivitis, developed such an extremely sluggish parenchymatous character and was so subject to relapses that a tuberculous cause was suspected. In all nine injections of 5 minims each of Koch's tuberculin, as supplied by Mulford & Co., were administered over a period of about two and a half months. Improvement began about a week after the first injection, and although

relapses took place, the eye at the end of the treatment was perfectly quiet. References are given to literature of treatment of non-ulcerative corneal tuberculosis by tuberculin.

ERNEST THOMSON.

(2) **Fox** (Philadelphia) has treated a dozen cases of vernal conjunctivitis by scarifying and scrubbing the palpebral conjunctiva with corrosive sublimate, 1 to 500. The cure was permanent in ten cases in which the disease had not existed for longer than five years.

ERNEST THOMSON.

(4) **Scheuermann** concludes, as the result of the study of eight cases of infection, that serumtherapy is efficacious in purulent iritis and in serpent ulcer of the cornea, but is useless in deeper infections, such as iridocyclitis and abscess of the vitreous.

ERNEST THOMSON.

(6) **Dor's** (Lyons) paper on the cure of detachment of the retina by tuberculin appears to the reviewer to form a vehicle for the conveyance of his faith regarding "inflammatory tuberculosis"; the detachment was cured by injections of Beranek's tuberculin (which is much poorer in toxins than tuberculin T.R.), plus various other forms of treatment. Since many detachments have been cured by many and various forms of treatment, including no treatment at all, one may be excused if one remains sceptical as to cause and effect, even if one admit that this detachment (in a myope) was due to tuberculosis. That question apart, however, it is interesting to hear what the writer has to say on his main subject. "As *chef de laboratoire* of the surgical clinic since 1892, I have seen successively come into being tuberculous rheumatism, and all those other chronic affections, visceral, nervous, aponeurotic, and so on, which the pupils of Poncet agree with him in considering at this day to be of tuberculous nature. In the name of pathological anatomy, I demanded the tubercle, the giant cell, the bacillus; I fought obstinately: I protested and demanded inoculability into the guinea-pig, but on all these grounds I have been beaten and have become, since my conversion, an apostle who burns what he once revered, fighting against heresy, and allowing the sick to profit by the consequences of the new truth. I proclaim, then, my belief that ferments emanating from tuberculous granulations are carried far from the focus, and that they affect by preference non-vascular tissues such as tendon, cartilage, and aponeuroses in general, and among tissues of special interest to the oculist, the sclera, cornea, lens, and vitreous. When I say ferments I am employing a somewhat vague term, for the substances elaborated by the tuberculous granulation are various. Some are true ferments, such as lipases, antilipases, others are toxins such as *chloroformo-bacilline* (causing necrosis and caseation), *etherobacilline* (causing condensation of collagen and therefore sclerosis), toxins which liquefy collagen (causing oedema), etc., etc. The tuberculous ferments, then, invade a tissue and create in it sometimes retraction, sometimes oedema, sometimes vascularization, sometimes a complete arrest of lymph circulation, *i.e.* necrosis; and all this goes on at first without bacillary intervention, without cell proliferation, and without construction of tubercles. It is in these lesions that the bacilli develop later on, and multiply sometimes, although not invariably. The lesions produced by the tuberculous ferments do not possess at first a tuberculous character; they consist in hydration or dehydration, retraction or oedema, arrest of the circulation or congestive attacks, and show themselves under most diverse clinical aspects. This conception opens up a very wide clinical horizon, and more than other clinicians, ophthalmologists should know about it, for few organs have so much important non-vascular tissue as the eyeball."

ERNEST THOMSON.

7) **Darier** (Paris) after preliminary remarks upon the value of clinical observations when sufficiently numerous—even though in opposition to

laboratory results, states that he has come definitely to the conclusion that all the acute inflammatory phenomena of iritis of whatever origin, are improved with extraordinary rapidity by the method of serum-therapy, alone or aided by certain topical or revulsive applications, when these are absolutely indicated. The inflammatory symptoms having been checked by this means, the cause of the iritis, whatever it be, must be treated in the usual way. Injections of serum have been largely replaced by buccal administration by Darier, and the patient is not informed as to the nature of the drug he is taking. A number of cases of iritis and uveitis are related, some of which are less complicated by other coincident treatment than others. One may analyse the first case on the list.—A patient of 42 years with violent plastic iritis of syphilitic origin; V.= $\frac{1}{6}$. No sleep for five nights. Ordered to take a tablespoonful (*cuchillerie à soupe*) of the following, every hour:

Roux serum 10 cubic centimetres.
Salt solution (0.7 per cent.) . . . 140 grammes.

After seven hours the pains disappeared. After two days the iritis had ceased, and on the fourth day, after taking in all 10,000 Behring units, the cure was assured. In this case it is to be inferred that atropine was only used by Darier at the consultations, and was not given to the patient for personal use. In drawing his general conclusions, Darier states that paraspecific serumtherapy is a powerful stimulant to the vital energy of the whole organism, which enables it to resist infective agents more easily, *but it probably does not exercise any direct bactericidal or antitoxic action*. It will act all the more quickly and strongly when the infection is recent and localised in a highly vascularized tissue; thus, it is of special value in acute infective iritis and irido-cyclitis, whether of endogenous or traumatic origin. It may be employed by intravenous injection, hypodermic injection, or given by the mouth. By the last-named method the risk of "serum sickness" is avoided. By the buccal route the action of the serum does not appear for about six to eight hours and in urgent cases a subconjunctival injection may first be given consisting of 1 c.c. of the Roux serum. ERNEST THOMSON.

(8.) **H. Coppez** (Brussels) cautions practitioners of the danger to the eyes of using atoxyl, either internally or locally. According to him, even minimal doses of the new remedy may cause complete and incurable blindness. Apart from this, sight may be lowered and the visual fields considerably contracted by the administration of atoxyl. To Coppez it seems that the bad results are produced by the aniline, and not by the arsenic contained in atoxyl. He reports a case where amblyopia followed a single injection of five centigrammes, and blindness was complete after five such injections. The patient, however, suffered from a multiplicity of disorders, including hereditary syphilis, arterio-sclerosis, nephritis, and disseminated choroiditis. Another curious case is mentioned where twitchings of the lid and redness of the eye followed every application of atoxyl to the tongue of a patient affected with tertiary syphilis. In Coppez's opinion, atoxyl should be administered only in the last resort. SYDNEY STEPHENSON.

(9.) **Morgano** (Cantania) recommends the use in eye work of a 20 per cent. ointment of Lepetit's almatema—that is to say, a condensation product of hæmatoxylin with formic aldehyde. It is of special service in various forms of keratitis, particularly the suppurative and phlyctenular, and also in ulcerous blepharitis. SYDNEY STEPHENSON.

(10.) **Dransart** advocates iridectomy for the prevention and cure of detached retina caused by progressive myopia. He also considers that the patient

should wear full correction, and should avoid stooping or any other movement likely to cause congestion of the head. As detachment of the retina is a condition always to be feared in progressive myopia, the author urges surgical interference in all cases in which medicinal and hygienic measures have no effect, in which vision is deteriorating in spite of rest, in which the condition is interfering with the patient's occupation, or is accompanied by headaches, vitreous opacities, or affections of the choroid and retina. The author recalls the first case he operated on for progressive myopia in 1880, which, with some others, formed the basis for adopting iridectomy systematically in the treatment of myopia. That patient, a minister, with -20 D. of myopia, suffered from intense headaches, and did not see sufficiently well to find his way about. He was operated on in both eyes, and is still performing his duties. Since then, the author has operated upon 362 cases, and he feels confident that he is justified in saying that iridectomy is the best treatment for progressive myopia, and, by implication, for the prevention of detached retina. The myopia in his cases varied from -10 to -35 D. Detachment occurred subsequently in four cases: one after a severe attack of vomiting; one in a peasant who had lost the other eye from detachment of the retina, and persisted in performing heavy work; the third had also lost the other eye from the same cause and had never worn glasses; and the fourth had iritis with synechiae. The author therefore considers that his method has been successful in 98% of the cases. The results of the operation are almost immediate disappearance of the headaches and the feeling of fulness and heaviness about the eyes, the arrest of the vitreous disturbances and their gradual but steady disappearance, and, lastly, the restriction of the visual functions.

PERCIVAL J. HAY.

BOOK NOTICES

Diathesis and Ocular Diseases. By A. MAITLAND RAMSAY, M.D.,
Ophthalmic Surgeon, Glasgow Royal Infirmary, etc. London: Bailliere,
Tindall, and Cox, 1909. Pages 184. Price, 3s. 6d. net.

The title of this little volume of post-graduate lectures is the only part of it to which the reviewer feels inclined to take exception; but whether "diathesis" be out of fashion or not, it forms a good enough scaffolding for the erection of a therapeutic edifice. As a clinical treatise based on wide personal experience, the book is admirable. The subjects which the author has chosen for this course of lectures are: asthenopia, phlyctenular diseases, "arthritic" affections of the conjunctiva, sclera, uveal tract, and retina—the last including toxic amblyopia and retro-bulbar neuritis—and glaucoma. All of these, both from the descriptive and therapeutic standpoints, are well done. The author's wealth of therapeutic resource is well known, and the practitioner will here find hints on the general treatment and dietetic management of the various diatheses for which he may search in vain in the text-books of ophthalmology. The book makes no pretence at being a text-book, so that one hardly requires to pick out any individual parts for remark or criticism. In the mind of the reviewer, the chapter on glaucoma stands out as one of the best short accounts of this disease and its treatment with which he is acquainted: it is up-to-date, and includes references to the works of Hendersen, Herbert, and Lagrange. The author's "thesis," on page 109, that tobacco and alcohol "are not the direct exciting cause of visual trouble, but only contribute to it by inducing

biochemical changes in the organism, which lead to retention of toxins in the blood," is interesting, although probably hardly sufficiently supported to be accepted unconditionally. Again, speaking of choroiditis in children, he says, "Children thus afflicted are said to suffer from progressive myopia but careful inquiry will often disclose an arthritic parentage and a history of 'growing pains' in the patients themselves." There are, indeed, several points in the book discussion on which might be most interesting.

Errors in the text seem to be almost absent. On page 40, "unicellular leucocytes" is presumably a slip of the pen. The book is nicely got up—good print, good paper; there are seventeen plates, most of them good, and a full index. E. T.

Les Injections Sous-Conjonctivales en Thérapeutique Oculaire Sub-conjunctival injections in Ocular Therapeutics. By Dr. SIGNORET. Thèse de Paris, 1908.

The following conclusions are given. Subconjunctival injections are ordinarily harmless provided the precautions indicated in the course of this book are observed. They appear to yield their best results in syphilitic or tuberculous affections of the eye, as well as in traumatic cases. They have been employed with success in keratitis, affections of the uveal tract, and even in optic neuritis. Gonococcal infections also are benefited, but the usual treatment for those conditions should not on that account be given up. The mercurial salts, and particularly the cyanide, 1 : 2,000, are generally employed. Sodium chloride appears to have a favourable action in detachment of the retina. More rarely we employ sodium salicylate in rheumatic affections, iodide of potassium in the treatment of cataract, and, lastly, tuberculin T.R. in ocular tuberculosis. The local reaction which follows the injection of tuberculin in the last-named affections may be extremely lively in certain cases.

A System of Ophthalmic Therapeutics. Edited and chiefly written by CASEY A. WOOD, M.D. Chicago: Cleveland Press, 1907. Price, cloth, 87 or half morocco, 88.50.

In this work Dr. Casey A. Wood and his collaborators have endeavoured to cover the whole field of the non-operative treatment of diseases of the eye, including prophylaxis, the internal treatment of the diseases associated with changes in the eye, and electrical and other special methods of treatment. The result will remind some of the now classical story of the curate's egg; but there is so much in the book that is really good, that it would be unfair to push the comparison.

The least satisfactory features of the book will be found away in the special chapters written to supplement the main text, which has been done by Dr. Wood himself. Chapter VIII gives a somewhat carelessly-written account of the different forms of electrical energy employed in treatment, and of the apparatus by which they are produced. The best parts are those in which the author Dr. W. F. Coleman deals with the physiological effects of the Faradic, galvanic, sinusoidal, and high frequency currents, the static machine, X-rays, and cataphoresis. In Chapter IX the same writer gives the results of electrical treatment in eye disease, in an almost unreadable compilation of quotations from numerous sources, including his own case-books. He seeks to uphold the results of electrical therapy against the attacks of those who think that they are chiefly due to "suggestion

coincidence, or the sprites," but it must be confessed that his manner of presenting his facts is calculated rather to defeat than to further his object. Even the proof-reading of this section has been faulty; printer's errors are numerous, there is a curious displacement of figures and descriptive numbers on pages 135 and 136, and mistakes are made with the names of N. Bishop Harman, Sydney Stephenson, Teulon, Terson, and Ziegler.

Chapter XI, by F. Allport, on the examination of the eyes of school children, and Chapter XII, by Nelson M. Black on the examination of soldiers and sailors, railroad and other corporation employees, although interesting in themselves, contain much that is irrelevant; indeed, it is difficult to see how descriptions of railway signalling systems, schedules of visual requirements for the army, navy, and railway services, and details of colour-vision tests, can claim a place in a system of treatment.

The same criticism applies, although in a somewhat different way, to A. C. Croftan's account of "the treatment of certain systemic diseases that involve the ocular apparatus," and D'Orsay Hecht's chapters on the treatment of the more important diseases of the nervous system that affect the eye; indeed, these two sections, although well written, are, in a sense, the most disappointing in the book, for the former is written from the general physician's point of view, and the latter from that of the neurologist, and neither of them makes any attempt to approach the subject from the ophthalmologist's standpoint. It is scarcely likely that the ophthalmologist will be called upon to treat such diseases as pernicious anaemia, scurvy, valvular disease of the heart, malaria, and rheumatic fever, yet these and many others are fully discussed in Croftan's article. Similarly, Hecht deals with the internal treatment of meningitis, cerebral apoplexy, infantile cerebral paralysis, labio-glosso-laryngeal paralysis, etc. He devotes three pages to the treatment of multiple neuritis, five to epilepsy, and six and a half to chorea.

Many of these conditions the ophthalmic specialist will seldom even see; on the other hand, there are diseases of the eye due to general systemic disease in which internal treatment is of the first importance, and still other conditions the symptoms of which bring patients in the first place to the ophthalmologist, but in which local treatment is not called for; and it seems to the reviewer that these might have been discussed from the ophthalmologist's point of view to enable the specialist to carry out, or at least to suggest, treatment on broad and rational lines. In the section on cerebral tumour, more might have been made of the question of palliative trephining. It may fall to the ophthalmic surgeon who sees a case of cerebral tumour, to urge the necessity of trephining for the preservation of sight, and to make his advice of real value to the surgeon, would require a fuller discussion of the subject than is contained in the paragraph referred to.

The remainder, and the larger portion, of the work is much more satisfactory, although we note, with regret, a number of small slips and printer's errors.

Peterson contributes a short chapter on general anaesthetics in ophthalmic operations, in which the suitability of the different agents for this purpose is discussed. He places them in order of their safety as regards life as follows: (1) nitrous oxide and oxygen, (2) nitrous oxide, oxygen, and ether, (3) nitrous oxide and ether, (4) ether, (5) chloroform, and expresses a preference for ether as the routine anaesthetic in eye operations. He does not favour the use of ethyl chloride. A mistake occurs on page 382 where he directs that the patient be placed in the *prone* position during administration of the anaesthetic.

Among the smaller chapters are a brief but interesting "History of Ophthalmic Therapeutics," by A. Murray, a clearly written review of the subject of serum therapy and diagnosis, by E. E. Irons, in which a cautious attitude

is assumed with regard to the value of these methods, and a short article by F. Brawley, on the treatment of diseases of the nose and neighbouring cavities which affect the eye.

We have left to the last the chapters contributed by Wood himself, which, as we have indicated, form the largest and by far the most useful sections of the work. Chapters III and IV discuss the ocular remedies under the class headings of anesthetics, astringents, lotions, ointments, miotics, mydriatics, etc. Chapters V and VI treat of the *technique* of ophthalmic therapy, and here we find much useful information about methods of applying ocular remedies, the use of the cautery, application of heat and cold, Bier's treatment, intraocular, intravenous, subcutaneous, and subconjunctival injections, etc. Chapter VII deals with some internal remedies used in eye affections, atoxyl, the iodine compounds, spa waters, trypsin, and the tuberculins being amongst those which receive detailed treatment. Two hundred pages are devoted to a review of the remedies used in the local treatment of eye diseases, and very little that could possibly prove of interest or value has been omitted. We find here, under each drug heading, the synonyms, chemical name and formula, sources, physical and chemical characters, solubilities, incompatibilities, physiological action, poisonous effects, and uses, and practical information is given as to the best methods of administering the remedies, prescriptions being often given. Chapters follow on ocular hygiene and the care of the eye-sight, on errors of refraction and their treatment, and on the non-operative treatment of disorders of the ocular muscles.

In another large and important section the author takes up in a systematic way the treatment of diseases of the lids, conjunctiva, cornea, iris, retina, etc., while special chapters are given to the fitting of artificial eyes, the treatment of ocular headache, the non-operative treatment of ocular injuries and sympathetic diseases, and the preparation of patient and surgery for operation.

Even this bare summary of the subjects dealt with will convey some idea of the scope of the book and its value as a work of reference. The chapters on remedies are, of course, more of the nature of a review than a confession of the therapeutic faith of the author, but the reviewing is well done and the result is eminently readable. Full acknowledgment is made of the more important sources of the information given, and among these special mention is made of the reviews of remedies by Sydney Stephenson, which have recently appeared in *THE OPHTHALMOSCOPE*.

A useful feature of the work is the very full index prepared by Dr. Herring, which could be further improved by a little more care in the placing of the sub-headings.

A. J. BALLANTYNE.

La Dacriocistorinostomia come cura radical e conservatrice delle suppurazione gran' del sacco lacrimale e delle fistole lacrimali. Risultati e dedizioni fisiologiche patologiche e tecniche. Dacryocystorinostomy as an operation for the radical cure, on conservative principles, of serious suppuration of the lacrimal sac, with results and physiological, pathological, and technical deductions. Par A. TOTI, Docente nell' Institut superiore di Firenze. Firenze: A. Meozzi, 1920, pp. 29.

In the May number of *THE OPHTHALMOSCOPE* (p. 356) a brief notice of Toti's method of operating, taken from *Die Zeitschrift für Augenheilkunde* will be found. We have recently received a pamphlet from the author which contains a more detailed exposition of the operation devised and practised by Toti.

The chief points are numbered and succinctly given, and are supplemented by remarks suggested by his later experience acquired by operating on forty-one cases.

1. The object of the operation is to secure the integrity of the lacrymal passages, and to take advantage for the manipulation that may be required of the larger space that is presented by the anterior region of the middle meatus of the nose; experience has shown that it is frequently necessary to remove the anterior extremity of the middle turbinal bone, either before or during the operation.

2. In performing the operation, the soft parts, including the periosteum, are to be divided concentrically to and a few millimetres from the orbital margin at the level of the internal angle of the eye. The incision must be carried a little inwards, and should, therefore, be parallel to the internal angle of the eye, midway between it and the middle line of the dorsum of the nose. The upper end of the cut should be situated half-way between the lower margin of the eyebrow and the palpebral angle. The inferior should terminate near the limit between the internal and the inferior orbital margins. The cut ought to be made at right angles to the skin, and should be carried perfectly vertically through all the soft parts, including the periosteum, to the bone. At the level of the internal angle of the eye it should pass about two millimetres in front of the tendon of the orbicularis; where the parts are infiltrated and unhealthy, it is well to direct the lower half of the cut a little towards the mesial line in order to carry it through more healthy tissue, and in that case a correspondingly larger portion of the periosteum requires to be detached, care being taken that this is divided along a line in close proximity to the orbital margin.

3. The next point to be commented on is the detachment of the periosteum from the ascending process of the superior maxillary body and from the anterior crest of the lacrymal canal, exposing outside the crest the tendon of the orbicularis, with the lacrymal apparatus as far as to the posterior crest, cutting obliquely from above downwards from before backwards and from within outwards. The ascending process of the superior maxillary bone with that portion of the internal orbital margin that forms the anterior crest of the nasal canal, then the bottom of the duct which offers individual variations in accordance with the relative proportions of the nasal process of the superior maxillary bone and of the os unguis. This surface should be exposed without perforation of the deep surface of the nasal mucous membrane. The commentary upon this is that the detachment of the periosteum is not necessary beyond the posterior lacrymal crest, and it is generally unnecessary to resect the crest itself. The resection of the internal orbital margin ought to extend somewhat downward and outwards so that the contours both internal and posterior of the upper aperture of the nasal canal may be better exposed; all the ethmoidal cells that are interposed between the resected portions of the ascending nasal process of the superior maxillary bone, and of the os unguis, and eventually of the internal orbital apophysis of the frontal, on one side, and the true and proper nasal mucosa, on the other, ought to be resected. The true nasal mucous membrane, thickened by its periosteum, in this region presents considerable resistance, and cannot be perforated except by inadvertence before the time during which this manœuvre is performed.

4. To resect a disc, or rather an oval, disposed longitudinally, of the internal wall of the lacrymal sac, taking care to remove the internal wall of the dilated sac in all its breadth and height from the apex of the cupola to the nasal canal.

5. To resect a portion of the mucous membrane of the nose exactly equal to, or better, somewhat larger than, the loss of the surgical substance made in the internal wall of the sac. In the case of stricture the resection of the mucous membrane of the nose is naturally larger. This ought always to be the final stage of the operation. The resection ought to be made with accuracy by means of a bistoury or sharp cutting-forceps, and after having made the mucous membrane stretch across the aperture in the bone with the little finger, if possible, or with a pledget of cotton wool, in either case introduced into the corresponding nostril along and behind the dorsum of the nose at the level of the middle meatus, and then pressed from before backwards and outwards so as to cover, as with a cowl, the portion of the nasal mucous membrane hitherto intact which ought to be resected.

6. The nasal duct need not attract attention; the suppression of its function ought necessarily to bring about its obliteration. In the inveterate form for the relief of which dacriocystostomy is intended the duct is either obliterated or in the process of obliteration.

7. To suture immediately the cutaneous wound, attaching great importance to everything that may aid union by first intention. If at the end of the operation the apposition of the margins of the incision can be rendered complete and the suture is small, excellent union by first intention may be accomplished. If the tissues are in an unhealthy state, owing to recent peridacryocystitis, one can or ought to assist the case by local remedies and thus partially or totally effect union by second intention without any anticipation or fear of cicatricial deformity.

8. To introduce lightly a plug of iodoform gauze into the anterior extremity of the middle meatus of the nose, which should be removed after the lapse of two or three days and need not be replaced. There can be no doubt but that the plug properly applied is of great service, but it is not easy to determine the exact size and form of the plug, nor the degree of pressure that should be exercised in order to absorb and dry the parts without occasioning stagnation or the accumulation of coagula from the deep surface of the cutaneous wound containing the anterior parietes of the lacrimal sac. Being cognisant of this difficulty, the author has tried to plug the nostril under the guidance of the frontal mirror, and, lastly, to avoid plugging altogether. He has obtained good results with all these methods, but cannot yet say which is the best. Perhaps some judgment is required: at the end of the operation, when the bandage is applied across the nostril, the plug already covering the wound should be raised and a fresh one applied, this being pointed above maintains the opening of the mucous membrane in contact with that of the sac much better than a plug introduced from above downwards. HENRY POWER.

CORRESPONDENCE.

[While *The Ophthalmoscope* will at all times welcome correspondence from its readers, the Editor does not hold himself responsible for any views expressed in this column.]

THE ARTIFICIAL SPECTRUM TOP.

To the Editor of THE OPHTHALMOSCOPE.

SIR,

I have read Dr. A. S. Percival's letter with amazement. My first impulse was not to reply, as I object to the tone of the letter. On second thoughts, I decided to answer, as I remembered that I am a very bad exponent. I always make the mistake of considering that my hearers or readers are well up in the literature of the subject, and had he not said so himself, I would hardly have believed that Dr. Percival could write a paper on this subject without being aware of the very able work done by physicists and the explanations given by them, especially by Shelford Bidwell, who has written paper after paper on the subject, most of which I have heard delivered and seen the original experiments. In *Nature*, Vol. 51, there is a long correspondence on the top, in which I joined, but I did not offer an explanation. Bidwell writes (*Proc. Roy. Soc.*, Vol. 60, p. 369): "The only serious attempts that I know of to explain the origin of the colours are those of Prof. Living and of Capt. Abney." He disagrees with these explanations and gives his own. This is the point to which I referred in my former letter. I wrote this letter because of the request for an explanation according to my theory. I did not deal with Dr. Percival's explanation at all: in fact, I stated that I had not heard his paper. I have, from the time the top first appeared, made numerous experiments, I have used discs of various colours, various degrees of illumination, various devices on the top, and different speeds per second of rotation of the top, also illuminating the top with light of different wave-lengths.

Now, it is only within the last few months that I have succeeded in finding the last links of my theory of vision, and as the evidence is not yet published, I cannot refer the reader to it. The theory is as follows.—A ray of light impinging on the retina liberates the visual purple from the rods and a photograph is formed. The rods are concerned only with the formation and distribution of the visual purple, not with the conveyance of light impulses to the brain. The decomposition of the visual purple by light chemically stimulates the ends of the cones (very probably through the electricity which is produced) and a visual impulse is set up which is conveyed through the optic nerve-fibres to the brain.

Abney has shown that with photo-chemical substances the chemical effect is not proportional to the intensity of the light—that is, a different curve is obtained with weak light from that formed with light of greater intensity. It is reasonable therefore to expect that the visual purple, which is formed by the pigment cells under the influence of a bright light, will be somewhat different in character to that which is formed in darkness. Again, from the chemical analogy which I have just given, even if the visual purple were of the same character, we should not expect similar curves with different intensities of light. It is probable that both factors are in operation. The variation is precisely similar to that of other photo-chemical substances. This deduction at once gives an explanation of the Purkinje phenomenon, or the

fact that when the eye is adapted to darkness the point of greatest luminosity is shifted more towards the violet end of the spectrum. Every acute observer knows how, when the sun sets, reds become darker and darker until they appear black, whilst blues and greens remain conspicuously visible. It is the same with the after-image of black: in a feeble light it is white, raise the illumination, it becomes yellow; raise it again, it becomes yellow-green; increase it further, it becomes pure green; try the experiment in the sunlight and it becomes blue-green. Now, the converse occurs when the eye is becoming adapted to light, the eye becomes more and more sensitive to the red end of the spectrum, so that the white is really first orange-yellow, then orange, and finally red. It is obvious that, if we have reached only the yellow or orange stage, the portion adjacent to the further black lines will appear violet-blue or green-blue, according to the stage. Increase the luminosity, and the colour becomes greener. In observations of this kind, I always make sure that it is not a personal peculiarity. I choose one of the most acute observers amongst my friends and get him to make the observation without knowing what he is expected to see. I repeated this observation with several persons, and in each case received the reply, "I see a pale green." As the experiment is very easy to make, will the reader try it for himself? Take a black object into the sunlight and place a large sheet of white paper beside it, keep the black object shielded from the direct rays of the sun and view it for thirty seconds; then turn the eyes to the white paper and note the colour of the after-image. I shall feel very much obliged to those readers who would send me a post card giving the result of the experiment.

I find, contrary to Bidwell, that though the red colour is certainly brightest at the edges of the lines, it extends over the whole of the black surface even when this is $\frac{1}{2}$ of an inch wide. The edges are brighter because the corresponding portion of the retina is better illuminated, owing to inexact accommodation, movement of the eyes, etc.

It may interest the reader to know that the explanation of the colours of the top will explain numerous other phenomena. I will choose two which have not yet received a satisfactory explanation, *viz.*, erythropsia, and shortening of the red end of the spectrum. If we suppose that in erythropsia, the eyes have remained in a state of light adaptation, the visual purple produced being more sensitive to the red rays, objects appear of this colour. As we should expect, erythropsia is frequently associated with hemeralopia. The luminosity curve obtained when the eye is partially adapted to light corresponds to the curve obtained with persons having shortening of the red end of the spectrum, so that we have only to assume that the receiving apparatus is less sensible to stimuli in some persons than in others to obtain an explanation, and we know that this exists with other sensations.

I am, etc.,

F. W. EDRIDGE-GREEN.

Hendon Grove,
Hendon, N.W.
May 7th, 1900.

CATARACT AND DACRYOCYSTITIS.

To the Editor of THE OPHTHALMOSCOPE.

SIR,

On page 343, 1st of May, 1900, number of THE OPHTHALMOSCOPE, your reviewer, in speaking of Post's article upon "A Successful Operation on a Cataract Complicated by Dacryocystitis," states "Post makes the very

remarkable statement that none of the text-books by Noyes, Fuchs, Norris and Oliver, Schmidt-Rimpler, or Meyer say anything about dacryocystitis as a complication in cataract-extraction."

On page 432, in the text-book of Norris and Oliver, in the chapter on "Cataract," is the following injunction in regard to operations upon cataract:—"No cases with lachrymal obstruction should be operated on till an attempt has been made to cure the disease by the means recommended in the chapter on the subject, because such a patient is very likely to have infection of the wound by pus regurgitating into the eye from the lacrymal canals."

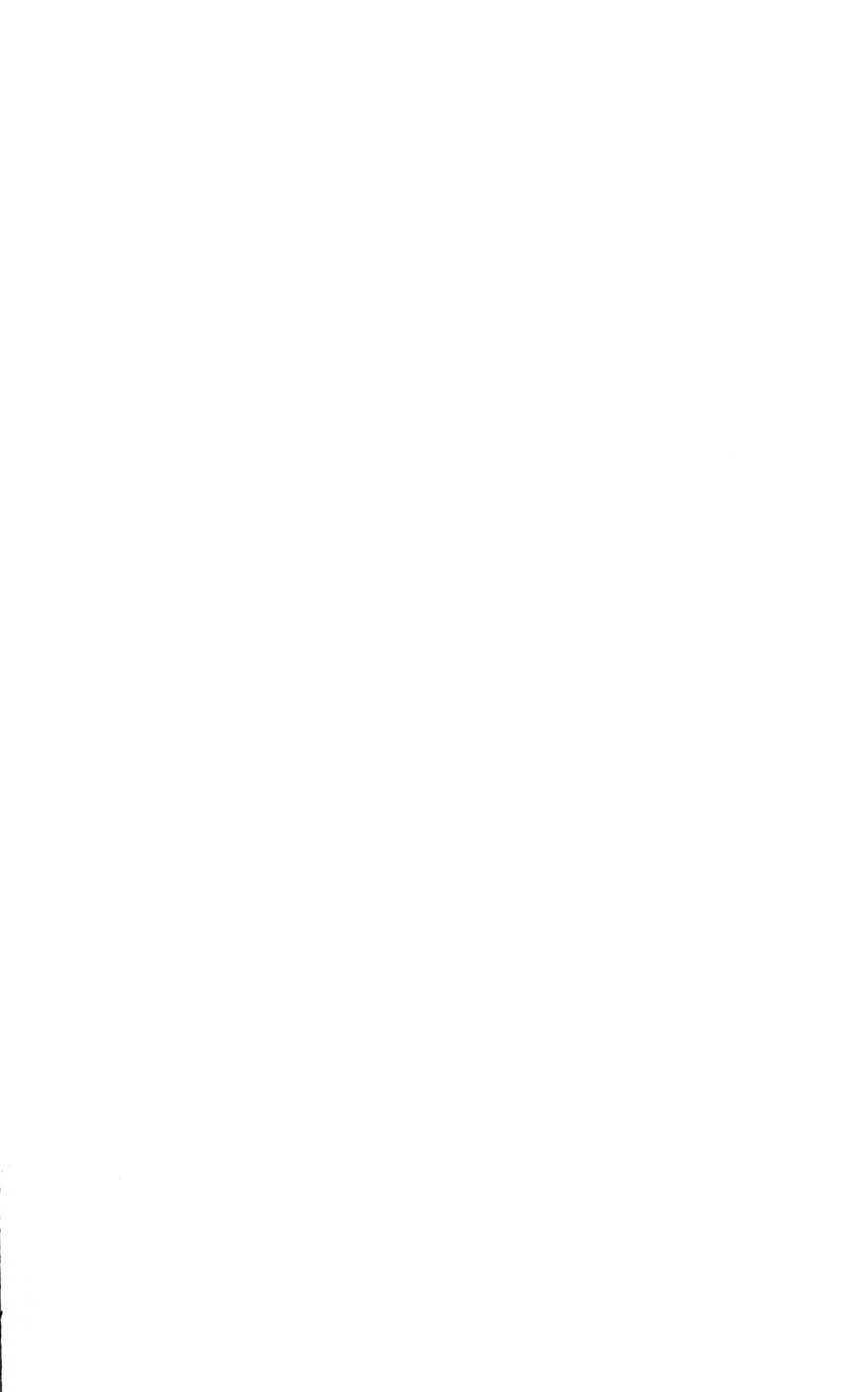
It seems but just to the memory of Dr. Norris that Post's statement should be corrected.

Respectfully,

CHARLES A. OLIVER.

1507, Locust Street,
Philadelphia, Pa., U.S.A.
May 10th, 1900.







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